ARCHIVES OF OPHTHALMOLOGY.

HERMAN KNAPP.

MARCH 17, 1832–APRIL 30, 1911.

HERMAN KNAPP died at Mamaroneck, near New York, on April 30th, in his eightieth year. With him passes one of the last of the eminent men who stood at the cradle of modern Ophthalmology. To his life applies Luther's version of the Psalmist:

> "Unser Leben währet siebenzig Jahre, und wenn es hoch kommt, so sind es achtzig Jahre, und wenn es köstlich gewesen ist, so ist es Mühe und Arbeit gewesen."

He had already achieved success in the old world as a scientific investigator, an author, a teacher, a physician, and a skilled and experienced operator, when he settled here and gave to America the benefit of his culture and learning.

He was born March 17, 1832, in Dauborn, Prussia. After the usual preliminary training in the humanities, he studied at the universities of Munich, Würzburg, Berlin, Leipzig, Zürich, and Giessen, taking the degree of Doctor of Medicine at the last-named university.

His student years fell in that memorable time in the history of Ophthalmology when Helmholtz had invented the ophthalmoscope and von Graefe and others, with its aid, discovered a new world. Knapp became very much interested in the new science of Ophthalmology, and made prolonged visits, in Berlin where Graefe had founded his clinic, in Utrecht where Donders had begun to systematize the anomalies of refraction and accommodation, in London where Bowman and Critchett operated, as well as in Paris where

he studied at the Sorbonne and visited the clinic of Desmarres. In the laboratory of Helmholtz at Heidelberg he did his first scientific work in physiological optics. The friendship with Helmholtz, begun at this time, lasted until the latter's death.

Knapp's paper on "The Optical Constants of the Eye" was presented as his thesis for admission to the teaching faculty at Heidelberg in 1859. Horner, in his autobiography, mentions that, at the meeting of the Ophthalmological Society in Heidelberg in 1860, Donders and Knapp read papers on "The Anomalies of Accommodation and Refraction." In Donders's book, translated by Otto Becker, *Die Anomalien der Refraction und Accommodation des Auges*, which appeared in 1866, Knapp is given full credit for his share in the development of this important branch of Ophthalmology.

The numerous scientific contributions of Knapp, in his Heidelberg period, were published in von Graefe's *Archives*. His paper on the asymmetry of the eye in its various meridional planes pointed out, for the first time, that meridional asymmetry of the eye constitutes a special class of refractive error.

His report on one hundred cataract extractions, according to v. Graefe's method (Vol. 13 of v. Graefe's *Archives*), deals in detail with the method of operation, the operative accidents, the after-treatment, the course of healing, the influence of the nature of the cataract on the course of healing, and the visual results. A second hundred of cataract extractions, giving similar details, is contained in Vol. 14 of v. Graefe's *Archives*. The extraction of the cataractous lens in its capsule was also practised by Knapp at this period. His assistant, Dr. F. Bergmann, reports thirteen cases operated on by Knapp (v. Graefe's *Archives*, Vol. 13, part 2). The results were not satisfactory. Knapp abandoned the method and remained averse to it.

In 1865 he was appointed Professor of Ophthalmology at the University of Heidelberg. He continued his scientific and literary work simultaneously with his university duties, and also conducted a clinic which he had himself founded. At this time he wrote his monograph on *Intra-ocular Tumors*.

In 1867 he visited the United States, and was much im-

pressed with the vast field for work which presented itself to him. A year later he resigned his Heidelberg professorship in order to settle permanently in New York. Here he founded a private clinic and hospital which was later incorporated as the Ophthalmic and Aural Institute. It was modelled after v. Graefe's Berlin clinic to which prince and pauper equally were admitted and were given the benefit of hospital treatment. Forty years ago there were no institutions in New York in which the well-to-do could receive the advantages of organized care. To make his institution available for all classes of society, rich and poor, marked a signal advance.

Before leaving Heidelberg, Knapp devoted much time and study to Otology, it being the practice in America, then more than nowadays, for one practitioner to unite both branches. Knapp approved of this dual practice, and in his prospectus to the ARCHIVES OF OPHTHALMOLOGY AND OTOLOGY, founded by him in 1869, and edited and published simultaneously in German and in English, he says:

> "The physiological connection between the organs of sight and hearing has at all times been deemed by eminent naturalists a good reason and a powerful incentive for extending their investigations over both the eye and ear."

Knapp came to America when still a young man, thirty-six years of age. When he first settled in New York certain coteries opposed him strongly. This, however, served merely to strengthen him. He had a compelling and sustaining energy. His working capacity, then and always, was unusual. His mornings were devoted to private practice, his afternoons to the Clinic, where, with his staff of assistants, he examined, treated, and operated until five or six o'clock. The early evening was given to his family life, the later hours to his literary labors, to the editing of the ARCHIVES, and to informing himself as to all that was new in medical literature. He was always a hard reader, and the extent of his information along the line of his specialties was unparalleled.

In a comparatively short time he had acquired a good command of English. In his speech he was terse and direct, emphasizing salient points without any attempt at rhetoric. When he wished to illustrate a particular point he would

go straight to the blackboard, and, with a few lines, give a clear idea of a pathological condition or an operative procedure.

As an operator, Knapp did brilliant work in the whole field of Ophthalmic surgery It was a rare treat to witness his operation for the extraction of cataract. In the first volume of his ARCHIVES, he published his third hundred of cataract extractions; and this was followed by the several hundreds, and finally the thousand of cataract extractions, with critical remarks in the various volumes of the ARCHIVES. He advocated a peripheral division of the capsule, and mentions, among its manifold advantages:

1. Simplification of the operative procedure;
2. Lesser liability to injury by operative manipulation;
3. Rapid healing of the linear wound in the capsule.

In later years he became an advocate of cataract extraction without iridectomy, and published a first, second, and third hundred of simple extractions. The results of his third hundred were: perfect, 96%; moderate, 3%; failure, 1%; and he concludes the article by saying: "The simple operation is not only the best, but also the safest method of extracting cataract. *Facta loquuntur.*"

The peripheral division of the capsule, which he first advocated, will probably always be employed for the very good reasons which he gave.

His private practice grew to extraordinary dimensions, and people came from all parts of the country to be treated and operated by him.

In his Otology he was much interested in physiological acoustics, and at one time gave a course of lectures on sensations of tone. In his clinical work he performed the operations of advanced aural surgery in a conservative spirit, and operated only when the indications were unmistakable.

Medical men interested in the study of Ophthalmology and Otology gathered around him at his Institute to see and to learn, some as observers merely, some as volunteer workers, and others as regular assistants. Of the men who either visited the institution or became connected with it during its first period, we may mention Charles J. Kipp, Thomas R. Pooley, Joseph Aub, E. Gruening, Xenophon Scott, Charles S. Turnbull, Boerne Bettman, Robert Sattler, H.

Gifford, Adolf Alt, A. Schapringer, R. Gebser, F. A. Munson, Thomas J. Dills, Edward Fridenberg, Cornelius Williams, and, in later years, Rudolf Born, F. E. D'Oench, Alexander Duane, Ward A. Holden, Charles H. May, John E. Weeks, Wilbur B. Marple, and Arnold Knapp amid a host of others. The prominence each of these men gained in his profession was due in no small degree to what he had imbibed in the atmosphere of the clinic. Knapp was a man of scrupulous intellectual honesty, and could not fail to impress his qualities of mind and heart on those who were closest to him. He was not a member of any club, and took no part in medical politics. He was a staunch friend.

In the forty years that Knapp was active in America, he accomplished a vast amount of work in many fields. During all this time, he was the executive surgeon of the Institute he had founded, and kept up a large private practice. He was Professor of Ophthalmology in New York University from 1882 to 1888, and Professor of Ophthalmology in the College of Physicians and Surgeons of Columbia University from 1888 to 1902. He edited the ARCHIVES OF OPHTHALMOLOGY AND OTOLOGY; and over one hundred and fifty articles contained in its pages came from his own pen, not to mention over fifty important contributions to medical literature, published in the Transactions of the American Ophthalmological and Otological Societies. In 1898 he contributed the chapter on "Eye Operations" in Norris and Oliver's *System of Diseases of the Eye*. He frequently attended the meetings of medical societies, where he read papers and took an active part in the discussion.

He was a member, and one time president, of the New York Pathological Society; one of the vice-presidents of the Academy of Medicine; chairman of the Section on Ophthalmology, and chairman of the Section on Otology of the New York Academy; charter member of the New York Otological Society; member of the New York Ophthalmological Society; member of the American Ophthalmological and American Otological Societies; and member of numerous foreign medical societies.

Of the instruments which bear his name, the improved lid forceps, permitting bloodless operations on the lid; the

needle-knife, used in discission of secondary cataract and division of the incarcerated capsule; and the roller-forceps for the cure of trachoma, will retain a lasting place in the outfit of the ophthalmic surgeon. He remarked, incidentally, that the idea of the roller-forceps was suggested to him on seeing the sugar-cane pressed out by the action of cylinders on a Cuban plantation.

In spite of his tremendous burden of work, Knapp never broke down; and, with the exception of a few attacks of bronchitis, his health always remained good. His principal exercise was walking. He was also fond of swimming. In his younger days he was a horseback rider, and often rode through Central Park after his hours at the Clinic. In stature he was above middle height, well-proportioned, and bore himself, even in age, with youthful elasticity. He had a florid complexion which also gave an impression of youth, even after his blond beard had changed to gray. He was twice married. Three children survive him, two daughters, Mrs. F. Kammerer and Mrs. G. H. Cocks, and one son. Arnold, who, as professor at Columbia University, and as executive surgeon at the Institute, is his father's worthy successor.

Knapp's recreations were few. Summer vacations were usually spent abroad, largely in observing the work of other men, and his notes on Ophthalmology and Otology, made during these journeys, testify to his continuous activity. He never travelled without taking notes. He himself says: "He who travels without taking notes overrates his powers of comprehension and memory, and does not know how to profit by one of the greatest opportunities for improvement." In a letter to a friend, written from Paris, February, 1886, he says: "I spend a large part of my time in the laboratory, and in Charcot's wards. He has an astounding material. Panas makes his clinic interesting, and has many cases." In 1897 he wrote to the chairman of the Section on Ophthalmology and Otology of the New York Academy as follows: "I attended the Congress at Moscow, where there was much to interest me. If you desire to have a report on my impressions of the Ophthalmological and Otological Section of the Congress for the Academy it is at your disposal."

As an editor, he would, on his own responsibility, correct

erroneous and omit unscientific statements. This course sometimes gave rise to acrimonious correspondence, without, however, altering his ideal as to the necessity of maintaining the scientific standard of his publication.

Knapp's memory is cherished, not only as a worker in a scientific field, but as a man of high ideals and noble character. His modesty caused him to avoid all ovations and forms of public recognition. He had no desire for applause and outward rewards, finding satisfaction in the work of his life. Even here he was his own sternest critic, and from first to last was constantly seeking to improve his methods. What he was to his associates may be seen from the subjoined extract from the resolutions of the Board of Trustees of the Ophthalmic and Aural Institutes at the time of his resignation in 1897. Mr. Strong, one of the Trustees, after speaking of Knapp's early life in Europe says:

"His subsequent career is known in scientific circles everywhere. The brilliant surgery by which he made himself famous as an operator, and the untiring research and genius by which he made himself famous as an author, all combined to make him one of the best-known men of his time in his department of human effort.

"His strictly professional career, however, is better understood and appreciated by his professional associates. His fellow-trustees can best speak of his relations to the Institute. In that, as in all his life, his guiding principle from the first was not that which Disraeli put into the mouth of one of his characters, 'The world's mine oyster, which I with tongue or pen will open,' but that other and nobler one of the great apostle who said 'I am debtor' to all men. In that spirit the Institute was founded, for he founded it. And he has ever since sustained it. The public contributed, to some extent; friends served with him upon the Board; other surgeons aided him in the surgical work here. But without him there would have been no Institute. Every day he gave to it abundantly of his time and skill, spending practically half of each day in its service.

"The Institute, however, could not exist merely upon a surgeon's time and skill. Money was needed to meet its

current expenses, and each year ended with a deficit. Then he, who had already done infinitely more for it than any one else, and in one way or another almost as much as all others combined, did still more. The treasurer received Dr. Knapp's check for the amount of each deficit, though it might, and generally did, run into the thousands. At last, he abandoned even the form of renting to the Institute the building which it occupied, and gave to it the free use of this building, a most valuable property, having already for its sake declined a most tempting offer for that property, at a figure which it may never be possible to realize again.

"But it is easier far to tell what he did than what he was. He combined in himself qualities of head and of heart either of which would have sufficed to make any man pre-eminent. Intellectual, as great German scientists always are and must be, he was also filled to overflowing with love of his fellow-men. No one could long associate with him and not see all this. No one having seen can ever forget it. It is with sad hearts that we face the hour when he must lay aside the harness, and the New York Ophthalmic and Aural Institute must go on in its work without him. Its debt, and the debt of this great community, to him can never be put into words.

"But since at the very outset, and all through life, he acknowledged his debt to his fellow-men, they can but try fitly to appreciate and acknowledge their debt to him."

E. GRUENING.

AN UNUSUAL CASE OF ECTROPION OF THE UVEA AND EXTENSIVE DEFECT OF THE IRIS.

By JOHN DUNN, M.D., Richmond, Va.

EVERY oculist who has ever looked at the pupils of horses has seen many times those dark brown fringes which protrude into the anterior chamber from the pupillary margins. The following remarkable instance of a similar condition in a man has been thought worthy of record. Personally I have never before seen anything at all resembling it in the human eye.

Mr. B., age 30, white, came to see me to have removed a foreign body from the cornea. The first glance at the eye revealed in both eyes what was apparently a blotched pupillary region in the place of a round pupil. As the color of the iris was light, this blotching of the pupil was all the more noticeable. Examined with a mirror it was found that no pupillary reflex could be obtained. Examined with a + 20 D. lens, under oblique illumination, this blotching was seen to be caused by the protrusion into the anterior chamber through the pupil, or from almost the entire pupillary margin, of large masses of brownish-black pigment which, though attached at one end, moved here and there in the aqueous with the movements of the eyes.

In the left eye there were in the deepest part of the cornea, presumably near Descemet's membrane, three small rings ½*mm* in diameter, clear in their centres, of this same pigmented substance. The corneal tissue about these rings was slightly opaque. In the right eye there were two similar rings, but larger. The same cloudiness of the adjacent cornea was present. The pigment in one of these rings was directly continuous with one of the pigmented fringes protruding from the pupillary margin,

showing unmistakably the source of all of the pigmented spots beneath Descemet's membrane. The right pupil I dilated with atropia. A central red reflex then became visible. The dilated pupil showed large gaps or deficiencies in what may be termed the inner circle of the iris—that containing the sphincter and the part adjacent to it. There are only fragments of the sphincter region of the iris. In two places these deficiencies were irregularly rectangular in shape, the pupillary side being wanting. The largest is situated down and out and the adjacent iris tissue is imperfectly developed. The deficiencies in the iris in no way resemble the smooth-edged, clear-cut coloboma iridis. The fundus was normal. The left pupil I did not dilate. The patient's vision, which in each eye was $\frac{1}{10}$, glasses did not seem to improve.

In the *Klinische Monatsblätter für Augenheilkunde*, February, 1911, Dr. Okuse, of Tokio, comments upon the literature of congenital ectropia uveæ and reports the results of the histological examination of an excised piece of iris. He found the iris tissue itself highly pigmented. The sphincter pupillæ was enormously enlarged both in width and in its anteroposterior diameter. The posterior pigment epithelial layer was notably thickened; this abnormal thickness, beginning at the iris root, increased towards the pupillary margin, whence sprang the characteristic pigmented masses. These excrescences consisted entirely of epithelial cells with no trace of connective tissue, and contained within them a cavity, triangular on cross-section, which corresponded to the so-called Sinus annularis of Szily. Dr. Okuse's case is interesting. He gives, however, no minute description of the gross appearances of the ocular condition. The interesting features in my case are the minute pigmented areas in the cornea and the appearance of the pupil when dilated with atropia. That the pigment in the cornea came from pigmented masses which at one time extended from the iris edge to the cornea is beyond question, for in one eye one of these masses still reaches across the anterior chamber and touches, if it is not actually adherent to, the posterior surface of the cornea, and the cornea at the point of contact shows the same pigmented spots seen in the other small corneal areas described above. In my case the pupil dilates not equally but throughout its lower half in a most ragged and irregular fashion, showing

a most unequal development of the sphincter portion of the iris at various parts of the lower half of its circle.

While there is no resemblance to the clear-cut colobomata iridis which are so common, at the same time the imperfect development of the sphincter in the inferior portion of the iris suggests that the condition may be and probably is the result of developmental faults similar to those which produce the colobomata. Dr. Okuse does not state from what region, whether lower, outer, inner, or upper, of the iris the piece he examined was excised. Its most interesting microscopical feature, however, is the abnormal development of the sphincter pupillæ, for it suggests that the pigment masses are in some way the result of, or connected with, the faulty development of the sphincter.

BILATERAL MARGINAL THINNING AND KERATECTASIA WITH PERFORATION ON ONE SIDE.[1]

By MILTON H. SCHUTZ, M.D.,

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(*With two figures on Text-Plate* VI.)

IN the past few years quite a number of cases of peripheral thinning and degeneration of the cornea, with or without ectasia, have been published, but the nature of the disease is not entirely clear. I therefore take the liberty of presenting the clinical report of a case.

A man (M. S.), age 18, entered the service of Dr. Oscar Dodd, Illinois Charitable Eye and Ear Infirmary, January 27, 1911 (House No. 30,893). The patient stated that he has had attacks of inflammation of the eyes off and on for the past two years; at these times there have been redness and some catarrhal secretion. The last attack began some two weeks ago. None of these attacks has been of such severity as to cause him to seek medical aid. This morning he was awakened by severe pain in the left eye.

On examination in the out-clinic a perforation with prolapse of the iris along the upper-inner margin of the left cornea was found, and the patient sent into the hospital at once. Eserin, ½%, promptly narrowed the pupil, after which pressure bandage was applied and the patient put to bed. Nothing unusual was noted with respect to the right eye at this time. Two days later the patient complained of pain in the right eye and an extended examination the next day (Jan. 30, 1911) revealed blepharoconjunctivitis of both eyes; the right eye shows a peripheral ectasia and thinning of the upper and inner quadrant of

[1] Read before the meeting of the Chicago Ophthalmological Society, February 20, 1911.

ILLUSTRATING DR. SCHUTZ'S ARTICLE ON "BILATERAL MARGINAL THINNING AND KERATECTASIA, WITH PERFORATION ON ONE SIDE."

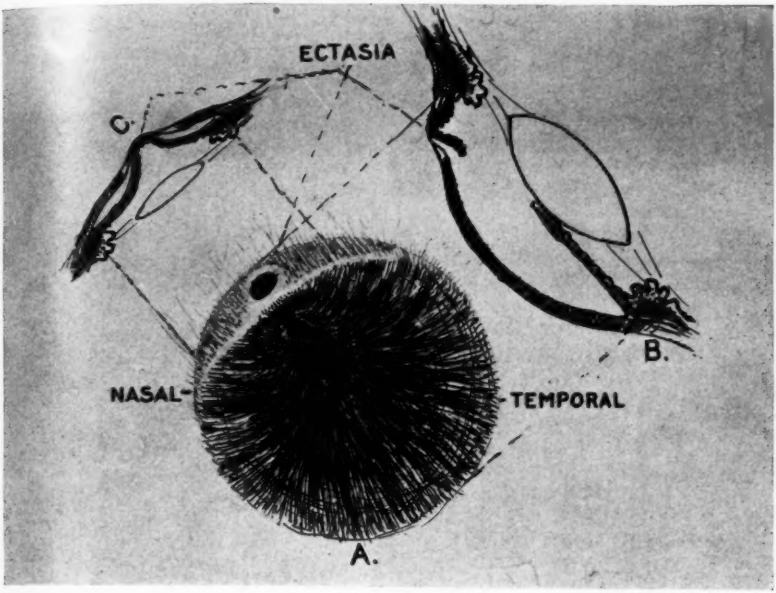

FIG 1.—Left Eye.

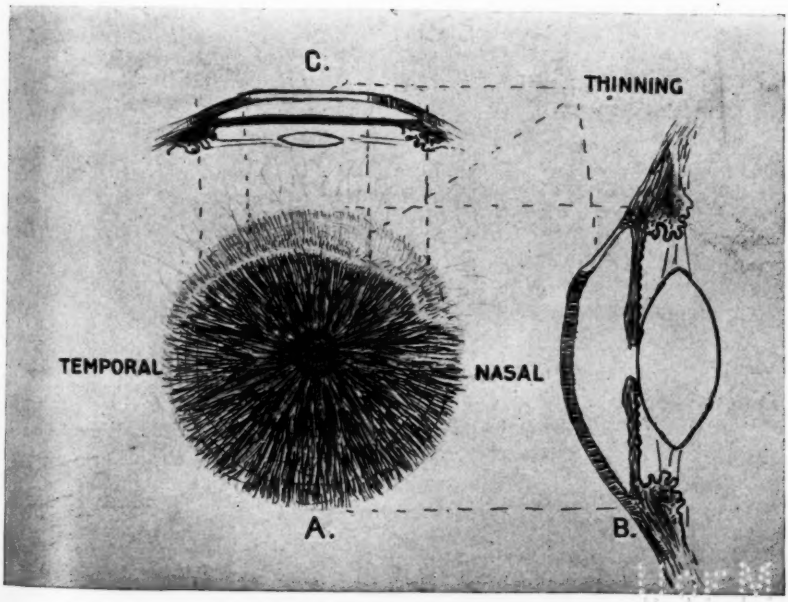

FIG. 2.—Right Eye.

the cornea, which seems in imminent danger of perforation on its nasal side. Viewed from in front the ectasia appears as a narrow crescent beginning 15 degrees temporal to the upper pole of the cornea and extending in and down in a curve to a point 15 degrees above the horizontal axis. The ectasia bulges about *½mm* above the normal surface level. It is broadest at axis 75 degrees, where it measures a scant *2mm*, and gradually narrows to an angle at either end. Toward the periphery it gradually grades down into the level of the sclera, but toward the centre of the cornea it presents a sharp angle of declivity. The ectastic margin in a sense overhangs the main portion of the cornea. Focal light shows a saturated narrow gray line of opacity along the central edge of the ectasia. The bulged portion is everywhere translucent and allows the brown iris to shimmer through. Innumerable fine branching and anastomosing vessels course through its superficial layers. The ectasia is distinctly anæsthetic in comparison to the normal cornea, especially in its nasal half. The rest of the cornea is entirely normal. The iris shows no evidence of active or previous inflammation.

The left eye presents an exactly analogous area of peripheral thinning extending from a point 10 degrees temporal to the upper pole down and in to within 15 degrees of the horizontal meridian (Fig. 1). As in the right eye it is bordered centrally by a narrow saturated gray line and is richly vascularized. Anæsthesia is even more complete on this side. In this eye, however, the bulging is not so marked. The thinned area is almost flat and the ectastic portion meets the main part of the cornea below at a wide angle (Fig. 1, B), so that the upper-inner quadrant of the cornea is thrown forward—that is, displaced anteriorly, and the curvature of the cornea decreased from above downward. Aside from this area of ectasia the rest of the cornea is normal except for four or five tiny faint dots of anterior stroma opacity just central to the middle of the gray dividing line. In this eye a perforation of the thinned area has occurred and a low hernia of the iris, covered over by epithelium, fills out the defect. The perforation is situated at the broadest part of the ectasia, is oval in form, and measures 2 x 1*mm*, and involves the body of the iris from its very root up to almost its pupil border; the pupil thereby assumes the shape of a pear and extends up and inward toward the defect; it measures 4*mm* in axis 135 degrees, and *2mm* in axis 45 degrees. The chamber angle is narrowed slightly in the entire upper-inner quadrant. The iris itself is normal. Upon manipulation both the conjunctival and ciliary vessels show marked over-filling.

Vision in each eye is practically normal ($\frac{10}{10}-3$). The bulging of the upper-inner quadrants of both corneæ has brought about an oblique astigmatism, measuring approximately 1 D. by the ophthalmometer. The radii of greatest curvature lie 40 degrees nasal and the radii of least curvature 50 degrees temporal to the vertical meridian on each side, and measure respectively 8.6 and 8.2*mm*. The change in curvature is therefore exactly symmetrical and of the same degree in the two eyes. No irregular astigmatism is present. The tension of the eyes is less than normal, but, of the same amount on each side (9*mm*, Schiötz's tonometer). Smears and cultures from the conjunctival sac on each side show a sparse Morax-Axenfeld diplobacillus and staphylococcus albus infection.

The subsequent history of the case has been striking and unique. Under pressure bandage and eserine, the marginal ectasia of the right cornea remained unchanged for ten days, then (Feb. 8, 1911) it suddenly and entirely disappeared, leaving only a flattened arc of very thin cornea. Indeed the area is now even depressed (Fig. 2, B and C). On the left side also the hernia has flattened down to about one half of its former height and now barely projects over the level of the rest of the thinned area. In the twelve days which have intervened since the right ectasia disappeared, the condition of the eye has not changed. A tiny phlyctenular-like conjunctival inflammation has developed at the temporal side of the left cornea, but has in no wise affected the main process.

We have here then to deal with a wholly typical case of peripheral thinning and degeneration of the cornea (in this case resulting in an ectasia on one side and perforation on the other), richly vascularized and separated from the rest of the healthy cornea by a saturated gray line of opacity.

Cases of this type were first thoroughly described by Fuchs in 1901. Most of his cases were in older people in whom a broad arcus senilis was already present, and he considered the process a degenerative one similar to that in arcus senilis, and complicated by thinning and atrophy of the marginal layers. At that time arcus senilis was thought to be caused by a hyaline degeneration, and Fuchs was unable to find hyaline shoals in the case which he studied anatomically. Shortly after this it was found that arcus senilis was a fatty degeneration, and the subsequent studies of Seefelder have shown that the degeneration of the cornea in peripheral

ectasia is also a fatty degeneration. This view, that the process is a degenerative one, has been accepted by most of the other authors, including Handman, Gilbert, and Coats. It is given very strong support by the fact that a very large number of the cases are complicated by a pterygium or pseudopterygium on one or both sides of the cornea, which, as now understood, are superficial degenerative processes.

Subsequent to the appearance of Fuchs's article, Lauber published three cases accompanied by more or less inflammation and without any arcus senilis, although the patients were 61, 66, and 74 years of age respectively. Karl Frank, Rupprecht, and Ischreyt have also reported cases which they considered were of inflammatory origin. One or another of these writers has suggested and held that the process may be similar to, or identical with, that described by Schmidt-Rimpler in his text-book as "furrow-form keratitis," or by Fuchs as keratitis marginalis superficialis. The most recent articles have, however, been concerned mainly with the question as to whether the process was a purely degenerative one, or one of degeneration accompanied by mild inflammatory reaction.

This case throws no light upon the question of etiology, but is unusual in (1) the early age of the patient (18 yrs.), (2) the entire absence of an arcus senilis, and (3) the disappearance of the ectasia while under observation.

I wish to thank Dr. Dodd for his kindness in allowing me the privilege of reporting this case, and Dr. E. V. L. Brown for his assistance in its study.

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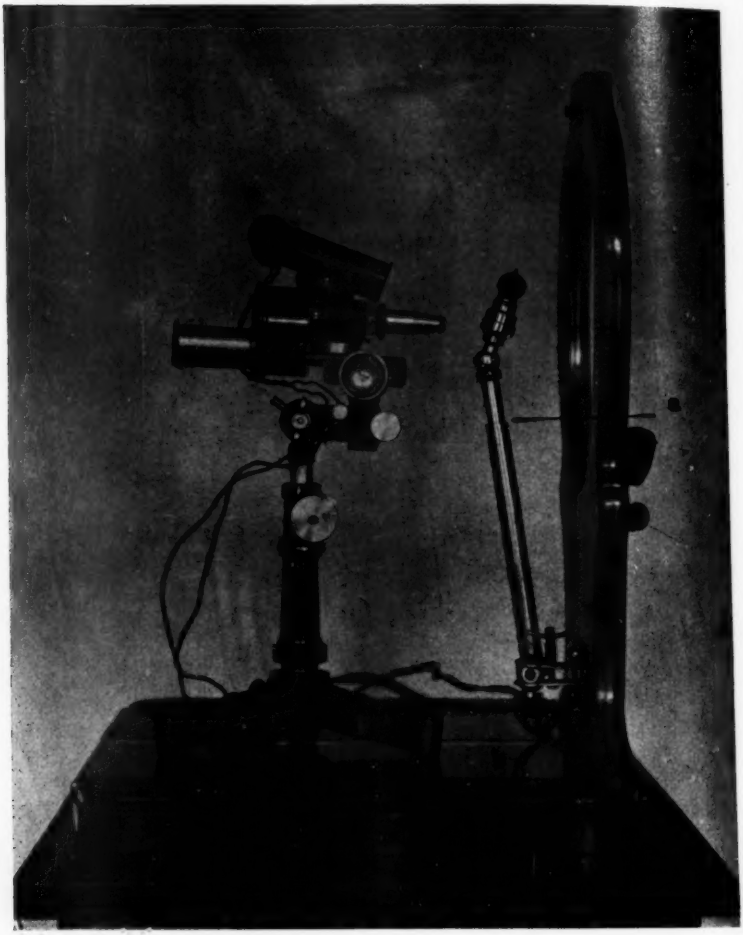
ILLUSTRATING DR. LUEDDE'S ARTICLE ON "IMPROVED ILLUMINATION FOR THE ZEISS BINOCULAR CORNEAL MICROSCOPE."



Modified Zeiss Binocular Corneal Microscope.

IMPROVED ILLUMINATION FOR THE ZEISS BINOCULAR CORNEAL MICROSCOPE—USED IN THE STUDY OF THE EPISCLERAL VESSELS AND THEIR CIRCULATION.

By W. H. LUEDDE, M.D., St. Louis, Mo.

(With one illustration on Text-Plate VII.)

THREE essential factors of a good microscope are sufficient magnifying power, perfect illumination of the object under examination, and mechanical adaptability. In the first respect the Zeiss binocular corneal microscope, described by Czapski (1), is easily the superior of any instrument of its class.

By the use of a variety of oculars and objectives its magnifying power can readily be raised to the point where the mechanical difficulties in the examination of the living ocular tissues render further increase undesirable.

Imperfect illumination aggravates these difficulties. After several attempts to improve the illumination furnished by the regular incandescent lamp and system of condensing lenses supplied by the Zeiss Optical Company, I found a small six-volt Tungsten lamp which gave incomparably better light both in intensity and whiteness.[1]

A sufficient source of light being provided, the next thing to consider is its applicability. The lamp and double condensing system were at first fixed centrally between and just

[1] These Tungsten lamps are not yet furnished by the Zeiss Optical Company, though they may have something of the kind to offer soon, after tests made at the author's suggestion. Any one wishing to procure the lamp described above can have it fitted into the socket of the old lamp by addressing Mr. Geo. Erker, of Erker Bros. Optical Co., 604 Olive St., St. Louis, Mo.

above the two microscopes. Later a provision for oblique illumination, consisting of a semicircular runner in which the lamp and condensing system can be slided from side to side, was added on suggestion of Professor Gullstrand (2).

The arrangement for oblique illumination (Gullstrand) is serviceable only in the horizontal plane and makes the instrument more cumbersome. Stargardt (3) surmounted this difficulty in his study of the nerve supply of the cornea by removing the lamp from the semicircular runner and holding it in his hand to illuminate the cornea from all possible angles.

For all such purposes I have added an incandescent Tungsten lamp, supported on an extension arm jointed and freely movable (see *a* on figure). It offers many advantages. The style of this extension arm can be varied at will. A coil extension arm would offer greater flexibility. Also a system of condensing lenses could be added if desired.

The attachment thus supported independently of the mechanism of the microscope leaves the latter free to be moved about without hindrance, a matter which is of great importance in following movements of the eye under examination, especially while using the higher powers. Two illuminating systems may be used separately or in combination.

Insufficient illumination is no doubt one reason why this instrument has not been more generally used in ophthalmology or for the study of circulatory phenomena as suggested by Schleich (4).

Another reason may be the rather awkward movable base which is still recommended in the Zeiss catalogue. Stargardt's suggestion to use a plain polished glass plate (see *b* on figure) as a base has proved far the best in my experience. On such a base the instrument can be pulled or pushed without restraint in all directions by the same hand that regulates the vertical and rotary adjustment, while the other hand is left free to make the finer focal adjustment. It is strange that in the Zeiss catalogue issued several years later no notice is given to such an improvement, which facilitates practical work with the instrument and at the same time simplifies its construction and should also lessen the cost.

Lastly, lack of experience and patience in the use of the instrument will always deter some practitioners from availing

themselves of the advantages thus offered for studying the entire anterior segment of the eye. The many details which are revealed in the tissues by the use of the higher powers (35 to 65 diameters) are naturally confusing on first observation. It requires study and repeated examination under the same and modified conditions before a reliable interpretation can be given. The same is true of all microscopic studies.

The ability to recognize readily the microscopic pathology of organs does not permit the student to ignore the study of microscopic changes. Neither should familiarity with the appearance of the cornea and iris as seen by the aid of the ordinary loupe and ophthalmoscope deter him from obtaining such additional information as can be revealed only by the use of a microscope of much higher power. My own experience confirms what Stargardt (3), Stock (5), and other investigators have said, affirming their ability to discover certain pathological changes earlier and to determine their character and extent better with the aid of the binocular microscope than by any other method. What that might mean in the timely recognition of sympathetic ophthalmia and in the early diagnosis of tubercular inflammations need not be further emphasized in this brief paper.

Perhaps no study with this instrument is more fascinating clinically than that of the circulation of the blood, the corpuscular movements, and of the changes in the conjunctival vessels themselves.

With the improved illumination, the blood corpuscles can be studied with an enlargement of 65 diameters. Schleich used 25, and Stargardt an enlargement of 35 diameters in their reported studies of conjunctival circulation. With the higher power the red corpuscles have a perceptible disk. It seems possible to distinguish differences in their color tints.

The variations in the quantity and velocity of the blood stream, as shown in the flow of the corpuscles, and the temporary absence of corpuscles from a portion of the capillary network, through which they can be seen to pass in detached columns, have been previously described. These capillaries fill up when a hyperæmia is produced by some form of irritation.

Another interesting movement of the blood stream, which

I have not seen mentioned, was an oscillatory flow without reference to the pulse-rate. The corpuscles flowing in a given direction after several seconds would stop, oscillate, and then flow back in the opposite direction. This movement was at times so well balanced that it was difficult to tell in which direction the stream really moved. I have found it present where there was a low blood pressure with and without actual valvular heart disease. For example, in a young man with a large aortic insufficiency; in another with apparently a normal heart, who was examined just after a slight syncope; in an elderly gentleman whose arterio-sclerosis had not been considered clinically because he showed a low blood pressure, etc. Examination of the episcleral vessels in the last case showed numerous small aneurysmal dilatations and abrupt variations in the calibre of the blood stream in all the vessels, as well as the oscillatory blood stream.

Obviously only a large series of observations with careful corroborative clinical examinations can make clear the significance of this phenomenon. That it depends on vasomotor conditions rather than on the heart's action seems certain. May not what equals temporary stasis of the blood be thus produced in certain areas and so explain some functional disturbances of the brain and other organs?

The changes of arterio-sclerosis occur first in the smaller vessels and the early pathological changes in the intima lessen the calibre of the blood-vessel, narrowing its stream irregularly. These facts render the examination of the conjunctival vessels a matter of moment for the early study and diagnosis of this disease—not to say that the conjunctival vessels are a constant index to the condition of the vessels in other parts of the body. Indeed it has been shown no set of vessels can be used as such an index. But the favorable location makes them so readily accessible to microscopic examination with the above instrument that it should be made in any case.

Much care has rightly been given to study of the manifestation of arterio-sclerosis in the fundus oculi. The examination of the conjunctival vessels with the binocular microscope, however, possesses several advantages over the ophthalmoscope. It has, first, much higher magnifying power (two or three times as much); second, the white background

of the sclera against which the vessels are sharply defined; and third, the absence of confusing reflexes. There is no good reason why ophthalmologists should not use both methods. In a large number of examinations, some of which are referred to by Dr. W. W. Graves in his studies on the significance of scaphoid scapula, the changes in the conjunctiva vessels could be much more clearly demonstrated though often present in the fundus and elsewhere. It was particularly striking to observe by this method the marked vascular changes in young people if syphilis, acquired or hereditary, was present.

The Zeiss binocular microscope can be shifted into various positions as shown in the illustration. In its greatest efficiency with patient study it promises accurate information otherwise unattainable and of enormous interest in other lines as well as in ophthalmology.

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A CASE OF SYMPATHETIC OPHTHALMIA, FIRST APPEARING FOUR DAYS AFTER REMOVAL OF THE EXCITING EYE, WITH HISTOLOGICAL REPORT

By Dr. CARROLL B. WELTON, Peoria, Ill.

A CASE of post-operative sympathetic ophthalmia, the first symptoms of the disease appearing several days after the removal of the injured eye, is a comparatively rare condition. The literature fails to show any great number of cases of this type of sympathetic disease.

On May 24, 1909, I was called by Dr. R. A. Hanna, of Peoria, to see a man, aged 35, a carpenter, who, an hour before while at his work, had been struck in the left eye by a large nail. At the time the accident happened, he was in a standing position, and while attempting to withdraw the nail, which was embedded at about the level of his head, it was suddenly released and flew backward with great force, rupturing the tunics of the eyeball. He reached up and withdrew a twenty-penny nail, which he said was "protruding outward between the lids." Examination showed a slightly bruised lid and a penetrating linear cut in the sclera to the nasal side, one-third of an inch long, beginning at a level with the centre of the pupillary space and extending at an angle of 75° along the limbus, down and through the ciliary region to a level with the limbus below.

There was much engorgement of the blood-vessels, the iris was torn and prolapsed into the wound, and the anterior chamber was full of blood. The vitreous was visible in the lips of the wound, but only a small quantity had escaped, as the contour of the globe was fairly good. The eye was painful. Vision in the injured eye was reduced to counting fingers at two feet. The fellow eye was normal. The patient was informed that immediate operation—enuclea-

tion of the injured eye—was advisable, because of the extent of the damage. This he refused.

The conjunctival sac was irrigated with a sterile boracic acid solution, and, after cocainizing the eye, the iris fragments were cut off. A conjunctival stitch was taken and the two surfaces brought together, covering over the greater part of the wound. A bandage was applied and the patient put to bed in a darkened room.

He was seen each day thereafter, and on the tenth day the wound was closed and no infection had occurred. The vision was taken each day, and at this time in the injured eye it amounted to counting of fingers at one foot. The projection was faulty. In the fellow eye, the vision was $\frac{20}{20}$ and the range of accommodation was normal.

The advice to have the damaged eye enucleated was repeated several times and each time refused. On the 30th day after the injury, the eye was showing a little tendency to "quiet" although the wound had closed. Because the eye was useless as a visual organ and fearing the possibility of sympathetic involvement of the fellow eye, the patient was told that further refusal on his part to removal of the injured eye would necessitate my withdrawal from the case. Then he consented and I enucleated the eye the same day. The eye was placed in alcohol and later sent to Dr. Brown Pusey for examination. The fellow eye on the day of the enucleation was free from any sign of irritation, and the vision was $\frac{20}{20}$ with normal range of accommodation.

On the morning of the fourth day after the enucleation of the injured eye, and the 34th day after the injury, he complained that his eye hurt him, that his vision was slightly blurred, objects had a "fuzzy look," and that it was an effort for him to read newspaper print. There was photophobia. The iris reacted well to light and on application of atropin dilated only partially. The media was fairly clear. Vision was $\frac{20}{40}$. In the choroid, at a distance from the disk, were present many nodes of a whitish yellow color, round in shape, some large and others small, lying under the retinal vessels. With these well-defined symptoms of sympathetic ophthalmia present, the patient was immediately put on massive doses of salicylate of soda as recommended by Gifford. He was given 80 grs. of sodium salicylate this day, hot applications to the eye, and an hour's sweat in bed. On the following day the patient said he had not slept well. There was engorgement of the deep scleral vessels; the eye was red and tender. Precipitates were present on Descemet's membrane and there were synechiæ. Exudate was present in the pupillary area

extending anterior and over the iris stroma to the temporal side. Details of fundus not visible. Pupil half dilated and immobile. Over the surface of the iris, a mesh of new blood-vessels was present. Repeated application of a 5% solution of atropin sulphate failed to produce any further dilatation and atropin was then discontinued.

On the 37th day, under the heroic treatment of the salicylates, the eye externally was not so red, the media clearer, and the iris was not so "muddy" in appearance. Ten days afterward, the eye was "quiet" and the salicylates were stopped. Three weeks later, he was discharged from the hospital.

On August 25, 1909, or about three months from the time of the original injury, the vision was $\frac{1}{10}$. Since then, efforts to locate the patient have failed, he having left the city.

Dr. Brown Pusey, who kindly offered to examine the eye, reported as follows: "The interesting part of the eyeball is the uveal tract, it being the seat of a marked proliferative uveitis of the type described by Fuchs as characteristic of the injured eye which leads to sympathetic ophthalmia. The choroid is more markedly involved than the ciliary body or iris. The choroid is swollen and is full of new cells——wandering cells and new fixed cells. The new wandering cells are mostly small lymphocytes. Many of the fixed cells show karyokinetic figures. There are many large epithelioid cells and here and there a giant cell. Plasma cells are present in abundance. The perivascular lymph spaces of the sclera are also the seat of a cellular infiltration like that found in the choroid."

I find in the literature twenty-seven cases of post-operative sympathetic ophthalmia, in all of which the sympathetic trouble began some days after removal of the exciting eye.

CASE 1.—MÜLLER. Woman, aged 35, one eye lost by small-pox—staphyloma and glaucoma. Excised some months later as it interfered with the other. Fellow eye normal. Five days after enucleation, attacks of photopsiæ, cloudiness, and dimness of vision. Retina was hazy and opacities in vitreous. Vision grew progressively worse. Under treatment, eye recovered with normal vision. Several months later cyclitis with glaucoma set in for which condition an iridectomy was performed. No final visual report given.

CASE 2.—H. SCHMIDT. After perforating wound of cornea, there were incarceration of iris, wound of lens, and intrusion of an eyelash into anterior chamber. The eye

was enucleated four weeks after the injury. The fellow eye at this time was normal. On the fourth day, after the enucleation, there was congestion of the eye with iritis. Vision was normal. Under treatment, complete recovery followed.

The enucleated eye showed the ciliary body detached from the sclera and infiltrated with blood and cells, and the ciliary nerves showed accumulation of cells between their fibrillæ.

CASE 3.—PAGENSTECHER and GENTH. Boy aged 14. Penetrating injury involving cornea and sclera with prolapse of iris and traumatic cataract. Enucleation, 27 days after injury. Fellow eye—vision, accommodation, and pupil reactions normal. On ninth day after excision, iritis appeared, although the vision still was normal. Then vision commenced to fail and condition of eye grew worse until a typical irido-choroiditis was present. No treatment availed. There were active inflammatory symptoms present eight months afterward. Vision then Jaeger 19.

CASE 4.—MOOREN. Excision of damaged eye, for penetrating injury. Fellow eye normal. Two months later, photopsiæ were present, but vision was normal. Six months later there was a neuro-retinitis, the retina hazy.

CASE 5.—COLSMANN. Man, aged 35, perforating wound of cornea, with rupture of lens capsule. Eye enucleated six weeks after the injury. "A few days" after excision there occurred in the fellow eye, loss of vision to $\frac{1}{100}$ with œdema at inner part of eye. No ophthalmoscopic changes. Four days later, neuro-retinitis was present with contraction of the visual field. In six weeks under active treatment (mercury) the eye improved. After six months, vision was nearly normal, with no contraction of the visual field. Two years after the inflammation the eye was still well.

CASE 6.—MCHARDY. Man, aged 38, suffered rupture of sclera from a blow, with subconjunctival dislocation of lens. Vision nil. Lens was removed and 15 days after the injury, the eye was enucleated. No symptoms of sympathetic trouble at this time. Twelve days after the enucleation (28 days after accident) the fellow eye showed conjunctival irritation and lachrymation. Vision was normal and iris dilated readily. In the course of the next two weeks, photophobia, ciliary congestion, iritis, vitreous opacities, with loss of vision to light perception. Under treatment for two months, with complete recovery, and four months after discharge, vision was $\frac{20}{20}$.

CASE 7.—NETTLESHIP. Man, aged 20. Following a cataract operation, an intraocular hemorrhage occurred

48 hours afterward, and the eye was excised on the tenth day after the operation. No sympathetic symptoms present in the fellow eye. Twenty-two days after the excision (32 after the cataract operation), sympathetic disease showed itself by commencing failure of vision. In one week, there was present a neuro-retinitis, and following shortly after this a severe irido-cyclitis, and glaucoma. After six months an iridectomy was performed, but the eye became blind. Microscopical examination of the excised eye showed inflammatory changes in the choroid, optic nerve, and retina.

CASE 8.—NETTLESHIP. Man, aged 67. Injury of eye, sclera being ruptured. The eye became inflamed and was enucleated 19 days after the injury. Twenty-three days after the excision (42 after accident), pain was present in the fellow eye, and six days after this, acute iritis set in, with extensive detachment of the retina following a week later. Eye under treatment recovered, the detachment reapplying itself.

CASE 9.—NETTLESHIP. Boy, aged 11, suffered a jagged wound near limbus with incarceration of iris. Eye was soft with purulent cyclitis and was excised 24 days after injury. Inflammation of the fellow eye began 25 days after the enucleation (49 days after the accident) had passed through a sharp attack of iritis. Synechiæ were formed. Recovery under treatment followed with fair vision.

CASE 10. SNELL, S. Man, aged 26. There was a penetrating injury to the eye, cornea and lens capsule being ruptured. There were slight signs of irritation of sound eye at this time. Injured eye was excised eight weeks later; foreign body (chip of steel) found. Thirty-two days later (106 after injury) plastic iritis was present, with turbid aqueous, pain, and diminished vision. With treatment (mercury, atropin) eye returned to a normal condition.

CASE 11.—W. ADAMS FROST. Girl, aged 9, who received a penetrating injury to eye—being struck with a stone. Vision p. l. The damaged eye was enucleated on the 34th day after the injury. At this time, the fellow eye was normal. On the twenty-second day after the enucleation (56th after the accident) there was dimness of vision with punctate opacities. Vision $\frac{1}{10}$. Fundus normal. Under active treatment (mercury, atropin, etc.) the eye recovered with vision of $\frac{1}{10}$.

CASE 12.—GOODE. Boy, aged 11. Penetrating injury of eye from a stone, the cut involving the cornea and sclera. The eye was excised two weeks later. Fourteen days after the enucleation (28 days after injury) the parents returned

with the child, stating that he had "caught cold in the other eye." Examination showed an iritis; irregular dilatation of the pupil on instillation of atropin, punctate deposits on cornea, no fundus changes. There was no tenderness, nor anything abnormal in the stump in orbit where the enucleation had taken place. Vision $\frac{2}{10}$. Under active treatment, eye showed final visual test of $\frac{20}{100}$.

CASE 13.—LLOYD OWEN. Girl, aged 16, received an injury in the eye by a fork. Fifteen days later, when the case was seen, there was a corneo-scleral wound, with incarceration of the iris, rupture of capsule of lens. Injected and painful globe. The swollen lens was removed. Eye excised 29th day after injury. Vision normal in the fellow eye at this time. Five days after enucleation (34th after the injury), eye became uncomfortable, with hazy vision. Six days after this, iris was dull, synechiæ were present. Cloudiness of aqueous; vision, fingers 3 feet. Under treatment (mercury and atropin) the eye recovered in ten days, with vision of $\frac{20}{30}$.

CASE 14.—DONALDSON. Woman, aged 33, received an injury to the eye, resulting in a subconjunctival rupture of the sclera. Vision p. l. Enucleation on the 20th day. Twenty-seven days after the excision of the injured eye (47th after the injury), the fellow eye showed punctate deposits on cornea, failure of vision, and dilated pupils. For five years was under treatment (mercury and atropin) at times, but vision gradually diminished until, at end of that period, it was reduced to $\frac{4}{60}$.

Donaldson says that "this was a case of sympathetic inflammation, which was active for more than five years. Progress of case during this time was variable—eye at times quiet and then painful, but there was progressive loss of vision." Microscopical examination of the injured eye showed a plastic cyclitis. (During this time, however, the author states that she had an attack of catarrhal ophthalmia which left some corneal opacity, which might account for part of the visual loss.)

CASE 15.—A. CRITCHETT. Man, aged 44, injury to eye by nail, which penetrated cornea and injured lens. Secondary glaucoma was present two days later and lens removed. Vision lost and eye was enucleated five weeks after the accident. Two weeks after the enucleation, the man suffered pain in the remaining eye. Seven weeks after the enucleation, the patient returned, stating that four days previous, the sight had grown "foggy." Examination then showed a contracted and immobile pupil, ciliary injection and tenderness. Vision p. l. A short time later, punctate deposits were present. Active treatment

(mercury, atropin) instituted, with recovery of normal vision.

CASE 16.—M. FAGE. Boy, aged 8. Large sclero-corneal cut of right eye from a knife wound, with iris prolapse. An infection of the eye followed and the eye was enucleated five days later. Thirty-one days after the enucleation (36 after injury), the fellow eye became inflamed. Injection of ocular conjunctiva, exudate in aqueous. The vitreous was also involved. Marked photophobia. Under treatment by subconjunctival injections of solution of cyanide of mercury, and also in cellular tissue of orbit from which the injured eye had been removed, the eye recovered completely in a period of fourteen weeks.

CASE 17.—BICKERTON. Man, aged 31. Penetrating wound of cornea and sclera with prolapse of iris into wound; eye was enucleated five weeks after the injury. Three days after the enucleation there appeared a plastic irido-cyclitis with an accompanying optic neuritis in the fellow eye. Under treatment (mercury, atropin) the eye recovered with vision of $\frac{6}{15}$ and was in the same condition when examined two years later.

CASE 18.—H. SPICER. Boy, aged 10, suffered a penetrating injury of cornea, with entanglement of a piece of the iris, in the wound. The eye was excised twenty-one days after the injury. Fourteen days after the enucleation, there was slight ciliary congestion of the second eye. On the eighteenth day, sight was "smoky," with photophobia and unevenness of corneal epithelium. Fine floating opacity of vitreous. Reflex of fundus dull, no details visible. Vision $\frac{6}{36}$ after two weeks' active treatment (mercury, atropin). Punctate deposits on cornea then seen, with fulness of retinal veins.

Final vision, after recovery, $\frac{6}{9}$, with opacity of vitreous remaining.

CASE 19.—E. V. L. BROWN. Man, 53 years of age, was struck by a piece of steel nail and suffered a penetrating injury of the right eye, causing a traumatic cataract and a plastic iritis. After the eye had been "quiet" for a period of three months, a combined cataract operation was performed, but after a period of thirty-four days the eye was removed, on account of recurrent irido-cyclitis plastica with pupillary exudate.

On the fifth day after the removal of the eye, iritis plastica, with ciliary injection and pain, appeared in the fellow eye. Complete posterior synechia after seven days. Vision $\frac{1}{30}$. After three weeks, pain and redness disappeared, and five weeks later the eye was without irritation and vision remained at $\frac{1}{30}$.

Histological examination of the enucleated eyeball showed a proliferative uveitis with epithelioid cells.

CASE 20.—KITAMURA. Male, aged 5 years. Perforating injury with iron wire. Forty-one days elapsed before enucleation was performed. Four days after enucleation sympathetic ophthalmitis began. Cure resulted.

CASE 21.—KITAMURA. Male, aged 70 years. After cataract operation, inflammation of the eye followed. Fifteen days after extraction, paracentesis of anterior chamber was done. Eye was enucleated forty-eight days after operation. Two days later, sympathetic ophthalmitis appeared. Course severe.

CASE 22.—KITAMURA. Perforating injury of one eye from iron splinter. Eye was enucleated twenty-seven days later. Ten days after enucleation, sympathetic ophthalmia broke out. Result—eye cured.

CASE 23.—O. DODD. "The cornea of the right eye was cut by a piece of glass, apparently not in the ciliary region. The iris was prolapsed and the protruding portion was cut off, after which a slight amount of vitreous escaped. There was practically no vision. The eye was enucleated about one month after injury. Five days later, the second eye became involved and vision failed, in spite of all treatment. Eventually the patient improved, until she could walk around. One year and seven months later, the patient returned again completely blind, the eye much inflamed, pupil filled with exudate, and prominent vessels all over the iris. By treatment the eye became "quiet," but only with light perception."

CASE 24.—MATTHEWSON. A man, 42 years of age, had been struck in the left eye by a flying piece of brass which had penetrated and remained in the eyeball. The eye at intervals after this had become red and painful. The injured eye at this time was blind. Two months later the eye was enucleated. Vision in fellow eye $\frac{1}{18}$ when he left the hospital. Thirty-one days after the eye had been enucleated, he returned to the clinic and said that during the previous day the fellow eye had become red and painful and the vision had become poor.

Examination showed a pericorneal congestion, small pupil, a small quantity of exudate within the pupillary area, and an anterior uveitis, with much fine opacity in the anterior part of the vitreous. Optic disk was normal and vision reduced to counting fingers at 10 feet. Pupil dilated moderately under 10% solution atropin sulphate.

He was admitted to the hospital and put under treatment. Recovery with vision of $\frac{6}{18}$ followed.

CASE 25.—GRADLE. Man, whose eye had been injured

forty years before. After a few weeks of fresh inflammation, the patient consented to enucleation. After 48 hours, the fellow eye became involved. The patient recovered with perfect sight, which remained permanent.

CASE 26.—D. M. CAMPBELL. Man, who was struck in the left eye by splinter of wood, producing a penetrating injury of cornea and a traumatic cataract. Three weeks after the injury the eye was much inflamed; there were great pain and prickling over the area supplied by fifth nerve. The patient ran a temperature of 99° to 100° and there was profound depression. The swollen lens matter was removed. Enucleation three weeks after the injury. Three weeks after the enucleation, the right eye suddenly became violently inflamed and in a few days was practically blind. Plastic irido-cyclitis with numerous posterior synechiæ ensued. Under the Gifford method of treatment, complete and permanent recovery followed.

CASE 27.—D. M. CAMPBELL. Man, who received penetrating injury at corneo-scleral margin, with iris prolapse and opacification of lens from a fragment of metal. Iridectomy was performed. Photophobia and lowered accommodative power present in the second eye. Injured eye was enucleated five weeks from time of injury. In three weeks from date of the enucleation, a plastic irido-cyclitis, pupillary adhesions, and lowered vision in the fellow eye. Recovery followed the sodium salicylate treatment of Gifford.

SUMMARY.

In the twenty-eight cases of this type of sympathetic inflammation, which I have collected, the shortest interval between the injury and enucleation was a period of nine days and the longest interval was two months. The injured eye was enucleated in sixteen cases within a month after the receipt of the injury. The length of time between the injury and the preventive enucleation seems to bear no relation to the onset of sympathetic trouble in the fellow eye beyond a period of nine days, as enucleation was performed at varying intervals from that time up to two months. The shortest time between enucleation and the outbreak of sympathetic disease in the fellow eye was two days, and in twenty-seven cases the disease appeared during the first month. This shows the time of onset of sympathetic ophthalmitis after enucleation to be within a month.

Eleven, or over one-third, of the cases developed during the first week after enucleation, and in these cases we may feel certain that, at the time of the operation, there was present in the fellow eye some very early and perhaps easily overlooked signs of migratory disease, indicating that before enucleation the infection had already reached the second eye.

Of the twenty-seven cases, in which final visual reports were given, sixteen, or 59%, recovered with normal vision. In seven cases the visual ability was reduced, and in four vision was lost.

The comparative mildness of the disease, when it follows enucleation, as these cases show, is of therapeutic value in the cases, which come to the surgeon, where sympathetic inflammation is already established in the second eye—in that, removal of the injured eye is indicated at any time.

Such a procedure is not so useless as it is often held to be, and the improvement sometimes following is not merely a coincidence, but is due to removal of an active source of infection.

As to the favorable action which sodium salicylate exercises in sympathetic ophthalmia, Campbell explains it as due to "an increase in the number of white blood cells or the production of a medicinal leucocytosis." "Such an action," he says, "was revealed by experimentation with blood counts before and after its exhibition."

An interesting feature of my case, which was also found in a number of these cases, is that the definite pathological picture of sympathetic ophthalmia, as pointed out by Fuchs, was present, viz., a proliferative uveitis.

This whole grouping shows clinically the process of sympathetic ophthalmia, but as stated before only a few of them were examined histologically and proven to be cases of sympathetic disease. These few show conclusively why, if, in a given case, when an injury has been received which is likely to produce the disease, if the fellow eye is to be saved, enucleation must not be delayed, but must be performed at once after the receipt of the injury, otherwise we are not sure that our patient will escape the transference of the inflammatory process to the fellow eye.

From an analysis of these cases, is it not justifiable to conclude as many do, that the process is one in which the infectious agent is carried to the fellow eye by the general circulation? The disease would be arrested at once by the enucleation, if the process were confined to that organ alone, but as this does not prevent in all cases the progress of the disease in the sympathizing eye, there must occur an outpouring of the infectious agent into the general circulation, which the removal of the source of the infection—that is, the removal of the exciting eye—is powerless to control.

Author.	*Year.*	*1st Interval.*	*2d Interval.*	*Result.*
1. Müller	1873	"months."	5 days.	No report.
2. Schmidt	1874	4 weeks.	4 days.	Complete recovery.
3. Pagenstecher and Geuth	1875	27 days.	9 days.	Jaeger 19.
4. Mooren	1877	No report.	2 months.	Lessened visual ability.
5. Colsmann	1877	6 weeks.	"a few days."	"Nearly normal."
6. McHardy	1878	15 days.	12 days.	$\frac{10}{10}$
7. Nettleship	1880	10 days.	22 days.	Blindness.
8. Nettleship	1880	19 days.	23 days.	Recovery.
9. Nettleship	1880	24 days.	25 days.	"Fair vision."
10. Lloyd Owen	1881	29 days.	5 days.	$\frac{10}{10}$
11. Snell	1882	8 weeks.	32 days.	Normal.
12. Frost	1882	34 days.	22 days.	$\frac{20}{20}$
13. Goode	1890	2 weeks.	14 days.	$\frac{10}{10}$
14. Donaldson	1897	20 days.	27 days.	$\frac{6}{6}$
15. Critchett	1897	5 weeks.	2 weeks.	Normal.
16. Fage	1897	9 days.	31 days.	Recovery.
17. Bickerton	1898	5 weeks.	3 days.	$\frac{6}{18}$
18. Spicer	1899	21 days.	14 days.	$\frac{9}{9}$
19. E. V. L. Brown	1907	34 days.	5 days.	$\frac{10}{10}$
20. Kitamura	1907	41 days.	4 days.	Recovery.
21. Kitamura	1907	48 days.	2 days.	"Loss."
22. Kitamura	1907	27 days.	10 days.	Recovery.
23. Dodd	1908	1 month.	5 days.	p. l.
24. Matthewson	1908	2 months.	30 days.	$\frac{6}{18}$
25. Gradle	1908	"A few weeks."	2 days.	Recovery.
26. Campbell	1908	3 weeks.	3 weeks.	Recovery.
27. Campbell	1908	5 weeks.	3 weeks.	Recovery.
28. Welton	1911	30 days.	4 days.	$\frac{10}{10}$

1st Interval specifies time between injury and enucleation.
2d Interval specifies time between enucleation and outbreak of sympathetic ophthalmia.

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THE INDICATIONS FOR OPERATION IN HETEROPHORIA AND SQUINT.

By Dr. ALEXANDER DUANE, New York.

(*Concluded from page 256*)

C.—PROGNOSTIC POINTS TO BE CONSIDERED BEFORE OPERATING.

(1) *Prospect of relieving the symptoms by operation.* We will suppose that we have eliminated the other likely causes of the symptoms and that, nevertheless, symptoms still remain. Further, we will assume that we have made an accurate diagnosis of the nature of the muscular trouble. In the third place, we will say that the trouble is one that can be helped by operation, and we have determined the right kind of operation to do. If these conditions are fulfilled, I have no hesitation in saying that the outlook for good results is in most cases excellent. Indeed, no greater gratification can be gained than from a well-conceived and well-executed operation of this sort. And in spite of accidents and of uncertainties that we cannot always provide for, I venture to affirm that the proportion of permanent good results is as great in this as in any other branch of surgery.

In all cases of exotropia and exophoria the prognosis of an operation is largely dependent on the *state of the converging power.*[1] Some are able to converge so as to maintain actual binocular fixation down to some point comparatively close to the eyes. This may be called the absolute near point of convergence. Others who cannot secure binocular fixation at

[1] Not, be it noted, on the power of the internal recti *per se.* Two individuals may have equal power in their interni as shown by their equal ability to rotate the eyes inward, but one may have complete converging power while the other is not able to converge at all.

any distance, yet can still converge the eyes strongly. In this case, when an object is brought toward the nose both eyes will turn in to follow it, although one will never turn in quite enough to fix the object. Both eyes may thus follow the object down to a point quite close to the nose. Such a point, the nearness of which measures in a rough way the effort made by the eyes to converge, may be called the relative near point of convergence. Now if a patient with exophoria or exotropia has a good absolute near point of convergence, the prognosis for operation should be excellent; and the presence of a good relative near point makes the prognosis very much better than if the patient did not attempt to converge at all.

The determination of the relative near point of convergence is also of prognostic value when there is a high degree of hyperphoria which prevents binocular fixation at any distance. If the patient under these conditions has a good relative near point, *i. e.*, if he turns both eyes in well in the attempt to follow an approximating object, the result of an operation for hyperphoria will probably be more successful than if no such convergent effort is made.[1]

Cases in which there is a lack of agreement between the amount of diplopia and the degree of deviation as determined by the objective tests, and to a still greater extent cases which show an actual *anomalous diplopia*, have been regarded as bad to operate on. I do not think so, although I admit that such cases will be likely to require longer and more careful orthoptic after-treatment and that double vision may persist for more than the usual period.

(2) *Possible dangers and disabilities produced by operation.* We are perhaps apt to lay too little stress on these. They may be enumerated as follows:

(*a*) The operation itself may be a *failure* or may actually

[1] This was well seen in a case of mine, a lady whose right eye was highly myopic and quite amblyopic. The right eye diverged and owing to a paresis of the superior rectus dropped some 10° below the level of the left. She had, however, good converging power and I consequently gave a good prognosis, which was justified by the event, since a tenotomy of the right externus and of the right inferior rectus secured for her permanent binocular fixation.

produce a condition worse than that which it is intended to relieve. This may happen in a tenotomy when we have divided unduly the lateral attachments of the tendon; and in an advancement because the adhesions or stitches have given way. In either case the result is a marked and permanent paresis of the muscle operated on. If these untoward events occur at the time of operation they can and always should be remedied at once—although the result of the operation then becomes more or less uncertain. In some instances, however, both in tenotomy and in advancement, the bad result may not occur until some weeks or months after the operation. It is then more difficult to remedy. These cases of delayed failure may be caused by the giving way of very slender adhesions, by atrophy of adhesions or of the tendon, by curling up of the tendon so that it adheres to the conjunctiva rather than to the eyeball, etc. Careful attention to the technique of the operation and particularly the avoidance of undue traumatism will in general obviate trouble of this sort.

(*b*) ***The ultimate results are somewhat uncertain*** in the best performed operations. No one can predict with certainty what the ultimate result of a tenotomy or an advancement is going to be, although in most cases we can form a pretty fair idea. We all know how the effect of a tenotomy, especially of the external rectus, often diminishes; and on the other hand, how years after a tenotomy of the interni we sometimes get an annoying divergence. We should have this tendency to remote failure in mind and try to obviate it by shaping our operation accordingly. We do not always succeed, since the remote ill effects are often due to developmental changes, the extent of which we cannot foresee. But in any event we should not be deterred from operating through dread of these remote ill consequences, which occur but rarely, and can almost always be remedied.

(*c*) Even if the operation is permanently successful, so that it accomplishes what we intended it to do, it sometimes entails ***disabilities***. Among such disabilities is, first, a moderate ***diplopia*** in the outlying portions of the field of fixation. In the case of a tenotomy this is due to a slight paresis of the muscle that was tenotomized; in the case of an advancement, to a cramping of the antagonist of the muscle

that was advanced. I have seen quite a considerable degree of diplopia produced in the upper field by an advancement of the inferior rectus—the latter being made so taut that the superior rectus[1] could not act well and hence behaved like a muscle that was paretic.

Even when permanent such a diplopia does not often occasion inconvenience, unless it is due to paresis or restriction of the inferior rectus. The temporary diplopia that occurs so often after certain operations is not only a thing not to be dreaded, but in many cases is actually desirable, since it indicates that our operation has been carried sufficiently far to be of permanent effect.

Even when there is no diplopia, there may be *discomfort* and a sense of *strain* in the eye, due to the attempt to move it with a weakened or too taut muscle.

It must be noted that these dangers, disabilities, and uncertainties of operations are most marked in those performed upon the *vertically acting muscles* and especially upon the *inferior rectus*. The latter, in fact, is a treacherous muscle to operate on. Not only are the results, immediate and ultimate, more uncertain than they are in the case of other muscles, but the bad consequences, if they do occur, are very bad indeed. They give the patient great discomfort, and are very difficult to remedy. I have seen several sad instances—some of them, I am sorry to say, occurring in my own practice—which attest the truth of this observation.

The dangers, uncertainties, and disabilities are also much more pronounced when operations have been done *repeatedly* on the same eye and particularly when they have been done repeatedly on the same muscle. So impressed have I been with this fact that I feel it highly important not to re-operate on the same eye if I can help it, and hence to get as much of my effect as I can with safety out of the first operation.

In any event we ought to remember that an operation on the eye muscles is not a thing to be undertaken lightly.

(3) *What will happen if we do not operate?* This will depend on the kind of anomaly present and on the symptoms. The deviation itself usually becomes more marked and also

[1] The superior rectus was not tenotomized.

more difficult to remedy, the longer operation is deferred. Diplopia often becomes less obtrusive, so that its attendant symptoms, such as vertigo and confusion, are not so troublesome. On the other hand, in certain forms of deviation the diplopia and its consequences tend to become more marked and more disturbing as the deviation itself increases. This is particularly the case in the convergent squint of childhood, when the squint itself is increasing and becoming constant, and before the habit of suppression has been acquired; in the convergence insufficiency of adolescents and adults when it is transforming from an exophoria into a divergent squint; and in many cases of paretic hyperphoria. In the congenital cases both deviation and symptoms (diplopia and head-tilting) remain as a rule unchanged. Sometimes, however, both become worse as the patient grows older; and in any event they are remediable only by operation.[1]

Asthenopia due to muscular troubles is very persistent, and tends to get worse rather than better. Reflex symptoms like headache may persist unchanged for a long time or may disappear if the patient's general condition improves so that his ability to resist reflex irritation is heightened.

In general, however, we may say that disabilities which are really due to a motor anomaly and which persist for months in spite of well-directed non-operative treatment, are not likely to be relieved ultimately without operation and in many cases are likely to get worse.

D.—THE TIME TO OPERATE.

(1) *When shall we operate?* I should say just as soon as we have satisfactorily decided—

(*a*) That there are symptoms of sufficient importance and permanence to warrant operation.

(*b*) That there is a muscular anomaly which can produce the symptoms, and whose precise nature and probable cause we have determined.

(*c*) That this anomaly is not one that is likely to improve spontaneously or by general treatment.

[1] The head-tilting may become less pronounced in some cases without operation.

(*d*) That the symptoms are not due to other causes than the muscular anomaly.

(*e*) That they cannot be permanently relieved by sufficiently prolonged non-operative treatment and especially by correction of the refraction, by orthoptic exercises, by the use of prisms, or by general measures.

(*f*) That the operation which seems applicable to the case will not be likely to cause discomfort or disability worse than the symptoms it is intended to cure.

The decision of these points in some cases can be made at once; in most cases takes at least several weeks or even months; and in a few instances may require one or two years.

Our decision once made, I see no reason for waiting. Usually the longer we wait the more unfavorable for operating the conditions become. Over-tense muscles become rigid, overstretched muscles become enfeebled, and the ability of the eyes to perform fusion, or, what is still more important, to overcome diplopia, becomes less.

There is, of course, one objection to early operation, namely that in the case of young children we have to use ether. This means some difficulty in gauging our effect and hence more uncertainty in the ultimate result. At the same time, the disadvantages of waiting are usually so great that in my opinion they much more than counterbalance the disadvantages of having to operate under ether.

Still less should we be deterred from early operation by the dread of remote ill effects, *e. g.*, the development of a divergence after tenotomy of the interni. This untoward result may, it is true, occur years after operation. It is, however, comparatively rare, and is not always due to the operation itself, as is evident from the fact that it sometimes occurs even when no operation has been done. Moreover, if it should occur, it can be remedied by an advancement. Hence to let a child go on for years with a convergent squint, simply because in a small percentage of cases the operation for remedying the condition turns out ill, seems to me ill-advised timidity.

(2) *Preparation for operation.* In all cases upon which we design to operate we should first prepare the patient for operation by suitable exercises. If one eye is somewhat amblyopic

or performs fixation with difficulty, it should be exercised by systematic occlusion and by atropinization of its fellow. Such uniocular exercises should not be kept up too long and should be followed by practice in binocular vision. Our first aim here is to get the patient to recognize diplopia; our next, to make him overcome it. Both objects are secured by properly varied exercises with the red glass,[1] the amblyoscope, the stereoscope, and prisms. Our ultimate aim in suitable cases is to secure true binocular stereoscopic vision and, failing this, to secure union of the images and exercise of the eyes in converging or diverging. In this regard the amblyoscope gives us very important aid. In fact, I think that really the main way in which this instrument acts is by training divergence and convergence, not by exercising fusion. Hence, in many cases in which true fusion cannot be attained the amblyoscope is still applicable.

Such exercises, kept up, if need be, for months, until the limit of their usefulness is reached, will put the eyes in far better condition for profiting by an operation than if they were not employed. The eyes are set approximately straight by the operation; but the best means for making them absolutely straight and for keeping them so after operation is found in the patient's continued efforts to secure single vision. The best conditions for success then are furnished when, on the one hand, the operation itself has reduced the deviation to a minimum so that it can be readily overcome by effort; and when, on the other hand, the desire for single vision and the ability to secure it have both been stimulated to a high pitch before operation.

E.—METHOD OF OPERATING.

The special operation employed will depend not so much on the direction of the deviation (divergent, convergent, etc.) as on its essential nature. Every case must be judged by itself, but the following represent the broad principles that seem to me to govern the majority of cases.

(1) *Esophoria and esotropia.* These conditions are often due to (*a*) a *convergence excess.* In this case the deviation,

[1] Or red glass before one eye and a green glass before the other.

slight for distance, is marked for near, and often increases spasmodically when the patient attempts to converge. Converging power and the outward rotations of the eyes are but little affected. Most cases of this sort yield to a full correction of the refractive error supplemented by orthoptic treatment. If not, my plan is to do a tenotomy of the internal rectus of the squinting eye. If the deviation is large to begin with—more than 25°—or in any case if after free tenotomy measurements taken at the time of operation show a large residual deviation, I would do a tenotomy of the other internus at once. If this supplemental tenotomy is not done at the time, I would do it at any time later just as soon as it was evident that the effect of the original operation was insufficient or was manifestly becoming so. This would be particularly the case during the first three weeks after operation.

If a satisfactory correction is not obtained by tenotomy, simultaneous or consecutive, of both interni, as determined by measurements just after the second internus is divided, I would do an advancement of the externus at once. This supplementary advancement may also, of course, be done later, if the deviation returns.

No tenotomy of the internus, whether unilateral or bilateral, should render the converging power and the power of inward rotation of either eye permanently less than normal, and we should always aim to leave a residual esophoria of a few degrees for near points at least. When, however, an advancement is done, it is well to get a slight over-correction, especially for distance, and if a simultaneous tenotomy of the internus is made, this over-correction may safely amount to 10–15°.

When (*b*) the condition is due mainly to a *divergence insufficiency* or to a weakness of the interni, the deviation is more marked for distance than for near, the diverging power is slight or absent altogether, and the converging power may be subnormal.[1] In this case, advancement of one externus, supplemented if necessary later by advancement of the other,

[1] We sometimes see cases of this sort develop out of the mixed cases (see *c* below), when the element of convergence excess has been relieved by correction of the hyperopia. In that case the squint for near, previ-

should be done.[1] Tenotomy of the internus, if done at all, should be done only to relieve the tension on the advanced muscle, and should not involve any extensive division of the lateral attachments of the tendon. Both in the original and in the supplemental operation we should aim to secure a primary over-correction—slight, if the internus is left intact, larger, if the internus is simultaneously divided.

Mixed conditions (*c*) of divergence insufficiency and convergence excess, associated often with weakening of the externi and undue tension of the interni, are found in most cases of advanced esotropia. Full correction of the refractive error will largely relieve the element of convergence excess and thus reduce the deviation, particularly for near points. Any residual deviation must then be remedied by advancement of the externus with a simultaneous tenotomy of the internus in the squinting eye, and, if this is not sufficient, by a similar operation on the fellow eye, done one or two weeks later.[2] Both in the original and in the supplemental operation a moderate over-correction should be secured.

(*2*) *Exophoria and exotropia.* These conditions (especially exophoria) are often due to (*a*) *divergence excess* or perhaps to an actual preponderance of the externi. In this case the deviation for distance is much more marked than for near, the diverging power is excessive, and the converging power is still good. If a squint is present, it is often still periodic, *i. e.*, found in distant vision only, while for near there is simply an exophoria with a normal near point of convergence. In these cases I do a free tenotomy of the externus in the squinting eye. If the deviation is large to begin with or if after a free tenotomy there is still considerable deviation left, I do at once a tenotomy of the externus in the other eye. If not done at the time, this supplemental tenotomy often needs to be done later—often, indeed, within a week or two—in

ously present, is abolished, while the deviation for distance persists because the glasses do not relieve the divergence insufficiency and weakness of the externi, which were present with the convergence excess and indeed developed out of it.

[1] To do an advancement of both externi at one sitting is not, I think usually advisable.

[2] It seems unwise to advance both externi at one sitting on account of the uncertainty of the ultimate results.

case the deviation, abolished by the primary operation, recurs. In the primary as well as the supplemental operation the attempt should be made to secure a decided immediate over-correction with the production of an homonymous diplopia. The tenotomy, however, should not be carried so far as to cause any marked impairment of outward rotation. If the effect of the supplemental tenotomy is insufficient, it can be combined with an advancement of the internus carried to the point of decided over-correction.

The exophoria or exotropia may be due to (*b*) a simple *convergence insufficiency*, or in some cases to a true weakness[1] of the interni. Then the deviation is slight or absent for distance and marked for near, the diverging power is not excessive, and the converging power is slight or *nil*. In this case I would advance the internus in the squinting eye, endeavoring to secure by the operation an over-correction of 10° to 15°. If I should not succeed in effecting this or if it seemed unwise to secure so great an effect from one eye, I might proceed to do an advancement of the other internus at once; but I would preferably postpone this supplemental operation until some two weeks later when I should be better able to foretell the probable ultimate effect of the primary operation. In the secondary even more than in the primary operation I would endeavor to secure a distinct over-correction. In either case, if I did a tenotomy of the externus at all, I would do it only to relieve the tension on the advanced internus, and would take particular care not to cripple the power of rotation outwards.

In the *mixed cases* (*c*) a convergence insufficiency is combined with a divergence excess and is often also associated with a weakness of the interni and with rigid externi. In this condition the deviation is marked for both distance and near, the diverging power is excessive, and the converging power weak or *nil*. This is the condition found in most cases of advanced exotropia. Advancement of the internal rectus in the squinting eye, combined with a simultaneous free tenotomy of the externus, is indicated, and quite often will have to be supplemented by a similar operation on the other

[1] Often post-operative.

eye, done preferably about two weeks later. In the primary as in the supplemental operation the attempt should be made to secure a decided immediate over-correction.

(3) *Hyperphoria and hypertropia.* These may be due mainly to (*a*) paresis of the *superior rectus.* In some cases the deviation is slight, and then often the paretic eye fixes and the non-paretic eye shows a marked secondary deviation (up-shoot when the gaze is directed toward the side of the paretic eye). This is especially shown in the congenital cases although I have seen it also in insufficiencies produced by tenotomy. In such cases a tenotomy of the inferior oblique in the non-paretic eye gives good results; and this may be done even when a further operation (advancement) is contemplated.

If there is nearly complete paralysis of the superior rectus, the foregoing operation may not by itself avail and it can be supplemented or replaced by an advancement of the paralyzed muscle. If possible, a temporary rather marked over-correction should be secured. The operation should not be combined with tenotomy of the inferior rectus, unless there is also marked diplopia in the lower field, and even then the operation should be done only to relieve the tension on the advanced muscle, and the utmost care should be taken not to divide the lateral attachments.

If the hyperphoria is due to (*b*) paresis of the *inferior rectus*, the operation of election is advancement of the paralyzed muscle with simultaneous free tenotomy of the superior rectus in the same eye. A moderate over-correction should be secured.

If the hyperphoria is due to (*c*) paralysis of the *superior oblique*, I would do a tenotomy of the inferior rectus in the other eye, being careful again not to produce a complete paralysis of the muscle by division of the lateral attachments.

A hyperphoria apparently *not due to paresis*—the deviation or diplopia being about the same in all parts of the field of fixation—is best remedied by a tenotomy of the superior rectus. Care should be taken not to produce an over-correction, nor to cause a paresis of the muscle by too extensive section of the attachments.

(4) *Technique of operation.* This is a matter in which

every man will have his individual preference, based on experience; and if due care is exercised, probably one method is about as good as another. The prime thing is to do the operation with as little traumatism as possible; and in the case of an advancement to secure a firm unyielding attachment without too much puckering or distortion. So far as advancement is concerned I personally like the single stitch (loop) operation, described by Oliver and which I employed for some time before I saw his description. But I have also seen excellent results from Worth's operation, Reese's resection, and Bruns's combined tucking-advancement; and there are numerous other operations which appeal to me as excellent but with which I am not so well acquainted. I rather prefer the form of advancement in which the sutures that draw the tendon forward are not used to close the conjunctival wound. When they are so used I sometimes find that, although the stitch is apparently drawn tight, there is some slack left beneath the conjunctiva that has not been taken up, so that the effect of the operation is insufficient.

In congenital paralysis and also in advancements done to remedy the excessive effects of a tenotomy, we cannot always determine in advance just what we shall do. The tendon must be completely exposed and carefully dissected away from its adhesions, and then brought forward in the best way possible.

(5) Whatever operation is done, the *effect should be determined* at the time by careful measurements; and by these the operation should be regulated.

(6) The operation should be supplemented and its subsequent *effect modified* by orthoptic exercises with the red glass, prisms, stereoscope, and especially the amblyoscope. In the case of a tenotomy, such exercises can be begun directly after the operation; in the case of an advancement, a week later.

(7) If there is a distinct under- or over-effect, the result can be extended or restricted by some one of the well-known operative procedures (re-division of adhesions, introduction of supporting stitches, etc.).

ON THE EFFECT OF ATOXYLON ON THE EYE.

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IN his article, "Optic Nerve Diseases Due to Poisoning with Organic and Inorganic Arsenical Preparations" (these ARCHIVES, vol. xxxix., No. 5, 1910), Schirmer mentions my interpretation of the way in which atoxylon acts on the eye.[1] As his question may easily be misundersood, and as my point of view is said to be contrary to Ehrlich's (p. 462), I will briefly repeat some of my conclusions concerning the form on which atoxylon produces its poisonous effect. There still remains the question, whether the secreted atoxylon body is unchanged atoxylon or a product of reduction. This question cannot be decided in an elementary analytical manner. By the kindness of Professor Ehrlich in Frankfurt we obtained the reduction product of atoxylon obtained by him, the p.-amidophenylarsenoxyd, and we were soon convinced of its unequal greater virulence. Rabbits which stand from 200–300*mg* atoxylon very well will die after subcutaneous doses of 10*mg* and even less of this substance. Taking for granted the high virulence of this product, the urine of animals poisoned by atoxylon must act as a strong poison on other rabbits in case it contains considerable quantities of reduced atoxylon. But injections of such atoxylon-urine resulted in the animals remaining alive and not showing any important appearances of intoxication. Therefore we came to the conclusion that atoxylon chiefly leaves the body unchanged. We may imagine that the effect depends on the unchanged atoxylon circulating in the body, but it is also possible, even

[1] Igersheimer, *v. Gräfe's Archiv f. Ophthalmol.*, 1909.

probable, that the organ cells, which absorb the poison particularly eagerly, change this substance into the utmost poisonous product of reduction. Up to now it has not been possible to decide this question, but one point seems certain, that in atoxylon poisoning we have to deal with two highly efficient factors: atoxylon or its product of reduction, and absorbed inorganic arsenic.

Therefore my point of view cannot be said to be contrary to Ehrlich's. On the contrary, I consider my experiments particularly qualified to support Ehrlich's opinion, who sees the true poisonous substance in the reduction product of atoxylon. To-day there can be no doubt, that the derivatives of phenylarsenic acid, to which atoxylon, arsenic, etc., belong, have a very considerable affinity for the nervous elements of the eyeball.[1]

I cannot let this opportunity pass without correcting a certain remark in the article of Birch-Hirschfeld and Kesten on this subject.[2] These authors quote my description of the retinal changes in cats and find it too summary. If I had only stated that the retina did not show any important changes and only distinct appearances of degeneration, as these authors claim, they would be right. This is not the case, for I wrote:

"The retina did not show any important changes but distinct appearances of degeneration in the ganglion cells. There were remarkable changes in the inner granular layer which consisted in, besides normal or in their form slightly changed granules, a great mass of cells with a large and deeply colored nucleus, especially quite close to the papilla. These cells retained a considerable amount of protoplasm around the nucleus and presented frequently fine delicate prolongation into the surrounding basement substance. The nucleus itself had an indented appearance. This made it improbable that they were lymphocytes or wandering cells, and the elements were never found in a greater number about the vessels. It is most probable that we have to deal with transformed inner granular layer-cells and with shrinking processes

[1] Igersheimer, *Münchener med. Wochenschrift*, 1910, No. 51.
[2] *v. Gräfe's Archiv für Ophthalmol.*, 1910, Bd. 26, S. 455.

within the nucleus of the cell. Similar cells are occasionally found in small numbers in normal specimens. The great mass of these cells and the destruction of the normal inner granules indicate a pathological process. This condition is by no means limited to atoxylon alone, but I found it also in experimental poisoning with arsenic and aniline. In my experiments the external parts of the retina showed as few pathological changes as the other membranes of the eye. Inflammatory processes were not present."

TO ILLUSTRATE DR. BORTHEN'S ARTICLE ON THE "OPERATIVE TREATMENT OF GLAUCOMA BY IRIDOTASIS."

FIG. 1.—Iridectomy.

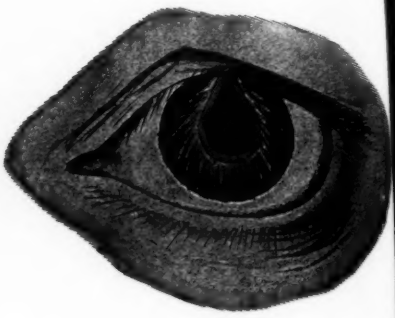

FIG. 2.—Iridotasis.

THE OPERATIVE TREATMENT OF GLAUCOMA BY IRIDOTASIS.

By Dr. JOHAN BORTHEN, Bergen.

Abridged Translation from Vol. LXV., 1, and Vol. LXVIII., 2, of the German Edition of these Archives, by Dr. Percy Fridenberg, New York.

(*With two figures on Text-Plate VIII.*)

CHRONIC simple glaucoma is a comparatively common form, representing 1% of all eye diseases. Iridectomy, even when performed *lege artis* by a skilful operator, is often ineffectual and vision is lost, sooner or later. None of the substitute operations has proven thoroughly and invariably satisfactory. Logetschnikoff, Hirschberg, and Schmidt-Rimpler agree that a complete and lasting cure by operation is the exception and that operative procedures may even hasten the glaucomatous process. A decided step forward was taken by Holth who in 1907 reported reduction of tension in 85% of his cases after iridencleisis. This procedure was intended to produce a fistulous communication between the anterior chamber and the subconjunctival lymph-channels by incarcerating the incised iris in the scleral keratome incision and allowing a conjunctival flap to heal over it. Bader and later Herbert had before this suggested incarceration of the iris for the same purpose. My own experience with Holth's operation and a tongue-shaped iris flap has been favorable. Of 26 cases, 9 were cured, 9 unimproved, and 8 could not be followed up. I have always doubted the advisability of incising the iris and making a flap for incarceration, believing this part of the operation to be unnecessary, and convinced that the same effect could be produced by inclusion of a fold of the iris, allowing its posterior surface to coalesce with the subconjunctival tissues, assuring a

position of the sphincter external to the section, and with this free drainage. This modification has the advantage of avoiding a step of the operation-incision of the iris—which requires skilful technique and a good assistant to hold the conjunctival flap down on the cornea during iridotomy. If reduction of tension depends on filtration, as I believe, and a fistulous communication is not a *sine qua non*, this modification of mine would afford a simple and effectual substitute for Holth's rather complicated procedure. This idea was suggested by the observation of a case of rupture of the sclero-corneal margin by blunt violence with incarceration of the iris under the uninjured conjunctiva. Tension was subnormal and the eye free from irritation, and this condition remained unchanged as long as the patient was under observation. My operation is intended to produce the very condition observed in this case. It is performed as follows: The conjunctiva is grasped with fine straight forceps about 10*mm* back of the upper limbus and a cut 2–3*mm* long made in the raised conjunctival fold with ordinary iris-scissors. The scissors are then carried toward the limbus, dissecting a conjunctival flap and keeping as near to the scleral surface as possible in order to include a large amount of subconjunctival tissue in the flap. Care must be taken to avoid fenestrating the conjunctiva near the limbus as this would not only expose the incarcerated iris to infection but interfere with filtration as well. The globe is now held with fixation forceps, and the lance knife, with a stop, Wecker's couteau lanceolaire à arrêt, introduced about 1*mm* back of the sclero-corneal margin, and carried down through the anterior chamber until the section is 4–5*mm* long. The conjunctival flap can be made by means of the lance knife when making the incision, but dissection with scissors insures the inclusion of subconjunctival tissue in the flap, and I believe this is a matter of practical importance for filtration and the formation of a subconjunctival bleb. The iris is now grasped at the sphincter with the iris forceps, taking up a fold 1–2*mm* wide, drawn out through the section and left there. Too much traction may result in the entire pupil being drawn up toward the wound, where it would be covered by the upper lid and interfere with sight. I have once or twice had to repeat the operation in very old patients with a

rigid iris which returned of its own account into the anterior chamber. A drop of atropin, instilled ten minutes before operation will insure the permanency of the prolapse, and does not cause increased tension, as I have observed. Both eyes are bandaged for one or two days, and the patient allowed up on the third. The operative prolapse appears later as a protrusion which may be concealed by more or less conjunctival œdema and is not disfiguring or annoying. In one case in which I incarcerated a large portion of the iris, there was some complaint of a feeling as of a foreign body under the lid. Tension is taken before and after operation with the Schiötz tonometer. The routine use of this apparatus has shown me, the utter unreliability of digital palpation. Schiötz places the upper limit of normal tension at from 22 to 31*mm* of mercury. I prefer Bjerrum's figure, 35*mm*.

I have operated in the manner described on 50 cases and have not seen a single case of simple or of absolute glaucoma in which it failed me. Even in cases of chronic inflammatory glaucoma the results were good, provided there was not marked irritation or congestion. In advanced cases with decided ciliary injection and changes in the iris, however, high tension persisted in spite of this operation. A comparison of this series with the 26 operated on according to Holth has convinced me that my simplified procedure is the better, and that the incision of the iris, especially, which is supposed to be of such importance for the formation of a permanent fistula, has, on the contrary, the effect of diminishing the prospects of permanently reducing tension. With the exception of four cases of advanced chronic inflammatory glaucoma in which, on the whole, operative incarceration of the iris was not indicated, tension was invariably reduced to normal or below; generally immediately after operation. Tension remained low during the entire period of observation, which amounted in several cases to almost a year.

In 5 cases unimproved by iridectomy, tension fell to normal immediately after operative incarceration of the iris. The same good result was noted in 7 cases of persistent high tension and progressive loss of vision and contraction of the fields in spite of Holth's operation. The least benefit was afforded in 4 cases of advanced chronic inflammatory glaucoma,

as the tension, though somewhat reduced, did not fall to normal. In 3 cases of the same sort, operated at an early stage, satisfactory results were obtained. The dangers attending the operation were slight, and certainly less than, for instance, in cataract extraction. In none of my 76 cases of iridencleisis (Holth) and my own procedure of iridotasis was there infection after operation or inflammation due to the incarcerated iris. The latter factor has been objected to as a dangerous feature of Holth's operation, but this view is not borne out by my experience. Time will show, I am convinced, that there is an essential difference between a prolapse of iris into a corneal wound, and the incarceration of the same tissue under a protecting conjunctival covering.

Since the publication of my first series of 50 cases I have performed iridotasis on 47 chronic glaucomas. Of the 97 operated eyes, 33 have been observed for a period of from 1¾–2 years or more. With the exception of 2 cases of chronic inflammatory glaucoma in which iridotasis was ineffectual, all these cases were cured, with normal tension and vision and fields as before operation; 27 cases were observed for from 1–1¾ years after operation. All but one case, chronic inflammatory glaucoma unimproved, were satisfactory; 19 cases were under observation for from 2 months to a year. All were doing well. The remaining 18 cases were under observation for 2 months or less. Of these, 2 cases of chronic inflammatory glaucoma were unimproved, and there was one case of panophthalmitis. We must admit that the results of these 97 operations were unusually gratifying, as tension was almost invariably reduced to normal or below in some cases, while as much vision was preserved as could possibly have been saved in any event.

In spite of these splendid practical results I must admit my inability to offer a completely satisfactory theory in explanation of the curative process, and am aware that a number of questions on this point still remain open. I believe that my operation, far from being a minor variation of Holth's procedure, casual and unessential in character, is, on the contrary, one which produces essential and radical changes in the mechanism of healing. Incision of the iris, iridotomy, may nullify the very effect, that of permanent drainage,

which it was to promote. The very fact, on the other hand, that the iris remains uninjured, according to my suggestion, and is merely drawn out and stretched, may account for the excellent results as to filtration and fistularization with the attendant permanent reduction in tension. Conceding the last fact, how can we explain it? I am convinced that the operation itself supplies a number of important factors which have to do with the structure and position of the iris. Inspection of these eyes after operation shows a very marked variation in the form of the pupil from that produced by iridectomy. It is oval or pyriform, with the point toward the incarceration. The radial arrangement of the iris fibres, too, is entirely changed so that, instead of converging toward the central pupil, they are drawn out in the direction of the prolapse. The crypts appear longer and the contraction furrows are smoothed out. This traction on all parts of the iris diaphragm is marked and may be so excessive as to draw the pupil away from the centre. I believe that this traction itself indirectly affects tension, much in the same way as, but more actively than, eserin and active accommodation. I am convinced that extraocular filtration is only one, and possibly a minor, factor in the reduction of tension, and that increased drainage through Fontana's spaces in direct consequence of the stretching of the iris plays an important rôle. The more rapid and effectual reduction of tension after iridotasis, as compared with the results of iridencleisis, would speak strongly in favor of this theory. The latter operation makes all stretching of the iris impossible and any reduction of tension is due to trans-scleral filtration solely. Tension is reduced rapidly by iridotasis even when the sphincter is not drawn out of the scleral section. As the iris in these cases forms a closed pouch, one would expect negative results, but as a matter of fact the reduction in tension is immediate and complete, indicating clearly that extraocular filtration is not the all-important factor. Finally it is worth noting that iridotasis may be ineffectual where the iris is atrophic, even if subconjunctival œdema appears over the prolapse. This applies to the advanced cases of chronic inflammatory glaucoma with high tension and amaurosis. The bad results in these cases are probably due to permanent obliteration of

the iris angle and atrophic changes in the stroma iridis. The failure would be quite natural if filtration depends on permeability in these structures and would support our theory of the mechanism of iridotasis. In conclusion, I wish to lay stress on the importance of operating under atropin mydriasis so that complete paralysis of the iris may prevent spontaneous reposition, the advisability of avoiding forcible traction on the iris after it has been brought out through the scleral section so as not to draw up the pupil, and the necessity of a somewhat more liberal scleral section (*8mm*) in very old patients with a rigid iris.

REPORT OF THE TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

MEETING OF MARCH 9, 1911, DR. G. A. BERRY, PRESIDENT, IN THE CHAIR.

Mr. Grimsdale showed a case of **crystalline opacities in the cornea**; two patients in the same family. Mr. W. H Brailey exhibited a **fixation speculum,** and Mr. F. A. Juler brought forward microscopical sections of a **neoplasm** involving the **iris,** from a case shown November 10th. Mr. Charles Wray showed a **sarcoma-like growth in the anterior chamber**; 16 years' history. Mr. J. B. Lawford, discussing Mr. Wray's case, said there seemed to have been something visible in the anterior chamber for 15 or 16 years, but the patient said that it had increased considerably during the last two years. He thought the most likely diagnosis was that there had been a mole or innocent tumor of the iris, which had now become sarcomatous. If it were sarcoma, there could be only one line of treatment, namely removal. He would be inclined to attempt to remove the growth, and a piece of iris with it, and examine with the microscope, basing the subsequent procedure on what the microscope revealed. He did not counsel leaving it alone. Mr. Elmore Brewerton showed a case of cirsoid aneurism, and Mr. Eason exhibited one of relapsing marginal keratitis.

Dr. Hill Griffith read a paper entitled **Three cases of optic nerve tumor,** illustrated with a number of photographs and specimens. He said that two were specimens of intradural and one of extradural growth. In the first case there had been protrusion of the right eye for 7½ years,

and when seen the patient had marked protrusion forward of the eyeball. Movements were good except downwards. There was a lobulated swelling between the globe and the inferior edge of the orbit. Distinct resistance was encountered. Vision, 16 J. The disk was pale and atrophic. At the operation the eyelids and entire contents of the orbit were removed by a circular incision, the eyebrow being preserved. The cavity was lightly packed with gauze. A month after the operation five Thiersch grafts from the patient's thigh were transplanted into the orbit. When seen recently the orbital cavity was well lined with skin, except at one spot. There was no discharge. Professor Lorrain Smith's report was that there were widely dilated lymphatics and lymph spaces in a matrix of vascular fibrous tissue. The larger spaces were lined with endothelium. In the second case there was marked displacement of the eyeball forwards, which had been noticed a few weeks. There was no sign of inflammation. The pupil only reacted consensually with that of the other eye. There was marked optic neuritis in the affected eye. There were no hemorrhages. He operated 11 days after seeing the patient, and removed the entire contents of the orbit in one mass, the eyelids being first reflected towards the nose by means of a horse-shoe incision, the flap being afterwards replaced and sutured. The tumor consisted of small round cells, and the tissue was richly supplied with thin-walled blood-vessels, and there were many widely dilated lymph spaces. Especially around the lymph spaces, the nuclei were massed together, and they varied in size and chromatic contents. The third case had had protrusion of the left eye for some years, and latterly it had increased. The eye movements were good. There was recent optic neuritis, with blurring of the edge of the disk all round. There were no hemorrhages. Shortly before the operation the vision had fallen to $\frac{6}{12}$, and there was well-marked proptosis. No growth could be felt. The external rectus tendon and outer canthus were freely divided, and then the growth could easily be felt, obviously surrounding the optic nerve. The entire orbital contents were removed. The growth consisted of cylindrical masses, made up of large epithelial-like cells, with a round central nucleus. He strongly recommended the procedure he adopted in these cases.

It was better to remove the lids entirely by a circular incision. The paper was discussed by the President, Mr. Treacher Collins, Mr. Lawford, Mr. Parsons, Mr. Coats, Mr. Frank Thomas, Mr. Wharton, Mr. Jameson Evans, Mr. Doyne, Mr. Mayou, Mr. Johnson Taylor, Mr. Grimsdale, and Mr. Harrison Butler, and Dr. Griffith replied.

Mr. JOHNSON TAYLOR read a paper on **A Morgagnian cataract.** The patient was an elderly spinster who had had the condition in the left eye 25 years, without any discoverable adequate cause. The eye, doubtless from long disease, had become amblyopic, and, though the direct pupillary light reflex was quite brisk and the tension normal, the projection was very defective. During the operation, which was a difficult one, owing to the sunken state of the eye, the small size of the cornea, and the narrowness of the palpebral aperture, no trace of a nucleus was discovered; the whole lens was found transformed into a milky fluid, with the exception of some inspissated material lining the capsule, which was removed by repeated introduction of iris forceps; after a subsequent needling the vision was $\frac{5}{12}$ (most) and 1 J. Two points were insisted upon: (*a*) that operation should not be refused just because the projection was bad, if the direct pupillary light reflex was brisk and the tension normal, especially in a long-standing case; (*b*) that prevention was better than cure, and that, as a general rule, one-eyed cataracts should be operated upon before getting over-ripe (except in persons of advanced age and those the subjects of serious disease), although the other lens was perfectly clear; the advantages of such procedure must counterbalance the disadvantages and possible risks. Messrs FRANK G. THOMAS and GEORGE COATS read a paper on a peculiar form of **granuloma of the retina.** The patient, a lad of 18 years, became ill in March, 1908, with influenza. Afterwards he developed pain in the hypogastrium and suffered from retention of urine and pyrexia. He had severe pain in the left brow and became drowsy and irritable. Routine examination of the eyes showed, in the region of the left papilla, an area resembling a greatly enlarged disk, and consisting of a central flat structureless portion, of the color of fundus elsewhere, surrounded by a ring of swollen nerve fibres. The retinal vessels emerged

from the inner edge of this ring. The right fundus was normal. Subsequently a discharge from the left ear developed and he recovered. Nearly two years later he came to hospital again. The eye was blind and glaucomatous, the anterior chamber very shallow, the retina detached. Enucleation was therefore performed. Pathologically an oval yellow mass, measuring 4*mm* by 2.5*mm*, was found in the stalk of the detached retina close to the papilla. The growth was purely retinal, and consisted of densely crowded cells, mostly slightly elongated. There was very little stroma and no organization within the mass, but on its vitreous surface a small quantity of old organized tissue was found. The iris stroma was atrophic, and many small new-formed vessels were present on its anterior surface. The corneo-iridic angle was occluded. Looking to the histological characters alone, the growth resembled a sarcoma more than a granuloma, but this diagnosis seemed improbable in view of its small size and slight amount of growth in two years. Moreover, primary sarcoma of the retina was unknown. An inflammatory origin was therefore probable, perhaps associated with the illness from which he had suffered—an illness accompanied by fever and a septic focus in the ear. On the other hand, had there been a septic metastasis in the retina one would have expected, after two years, a fully organized cicatricial mass, not a richly cellular tissue; moreover, there seemed to be evidence of slow progression during these two years. The histological characters did not accord well with an origin by retinal or subretinal hemorrhage.

MEETING OF MAY 4, 1911, MR. GUSTAVUS HARTRIDGE, VICE-PRESIDENT, IN THE CHAIR.

The following card specimens were shown.

Mr. TOMLINSON, **A model** to show a curious color effect due to **simultaneous contrast**; Mr. DONALD, a **family with discoid cataracts**; Mr. WORTON, a case of **albuminuric retinitis**; atypical macula in the other eye.

Mr. NETTLESHIP read a paper entitled **New cases of hereditary nystagmus.** He presented two extensive new pedigrees of hereditary nystagmus; one, containing 27 cases, by Dr. Auden, of Birmingham. Two other small new pedi-

grees and nine published ones were brought in for purposes of comparison and classification. Examination of the whole 13 pedigrees showed that in some of them the nystagmus was associated with movements of the head, whilst in other pedigrees no head-movements had occurred. Further analysis disclosed the, possibly important, fact that in the pedigrees showing both eye- and head-movements the abnormality affected both sexes and could be transmitted by either male or female parent; whereas in the genealogies containing nystagmus alone, with no head-movements, the abnormality was strictly limited to males and transmitted only by mothers (themselves unaffected)—the same male-limited inheritance that is seen in color-blindness, hæmophilia, etc. Two isolated exceptions to these findings were recorded, but the testimony for both of them was remote, indirect, and regarded as inconclusive. The rapidity and amplitude of the nystagmic movements varied greatly in the different members of both the sub-groups, but the direction was horizontal in all. There was evidence that in some cases both nystagmus and head-movements had diminished with age. In almost all cases in both sub-groups the nystagmists had defective sight and marked ametropia, usually hypermetropic astigmatism, and in many of them the blue irides and relatively light choroids pointed, in the author's opinion, to some degree of ocular albinism. There was no evidence of disease of the nervous system in the affected stocks. Parental consanguinity was noted as absent in the majority and not noted as present in any.

Professor BATESON (Cambridge) regarded the paper as the most important work which Mr. Nettleship had yet done on the subject of hereditary or family diseases. The suggestion which it implied was that one could classify cases into groups: those in which there were head-movements, and those in which that affection did not exist. And it was reasonable to hope that by more attention to clinical detail it would be possible to purify the cases and get out the aberrant cases, and leave a clear result. In the pedigrees exhibited there was something like Mendelian descent, though there were some hitches. He pointed out that the difficulty in forming an idea of the descent of a sex-limited affection was, that it was

not accurately known how sex itself descended; so that the argument was a circular one. If sex did descend in the way in which speculation suggested, a scheme could be drawn up of a sex-limited disease. Biologists were looking to the medical profession with constant curiosity for the production of cases where some affection was limited to females, in the same way as there were known to be diseases limited to men. He did not of course refer to peculiar women's diseases.

Mr. HERBERT read an interim report on **the small-flap sclerotomy**. He reported upon a series of 54 small-flap operations for glaucoma, primary or secondary, including 14 mentioned a year ago. Thirteen of the operations had been performed with Bishop Harman's twin scissors. There had been some failures, partial or complete, in blind or nearly blind eyes only. One was due to firm adhesion of iris to the wound. An iridectomy should have been made, as it was a case of acute glaucoma with congested and swollen iris. Two other failures occurred in advanced glaucoma, secondary to uveitis, and it was thought that some such cases might prove unsuited to the operation. The wound showed a tendency to heal up firmly, possibly owing to an excess of albumen in the aqueous. A suggestion was made of partial sclerectomy after failure in any such case. In three other eyes the filtration, for a time at least, was insufficient to relieve the tension fully, though enough to relieve pain. In one of these cases the deficiency in filtration was probably due to a too shelving incision, entering the anterior chamber at some distance from the angle. The primary incision, at the surface of the sclerotic, need never be more than $2\frac{1}{2}mm$ from the corneal margin, provided the incision were not made too shelving. In some of the Nottingham cases the distance was decidedly under $2mm$. In 15 cases openings had been made unintentionally at the base of the iris, mostly small irido-dialyses. In operating with Bishop Harman's twin scissors the necessary reflexion of the conjunctival flap might influence the result. There was not the same persistent conjunctival œdema in these cases, and the primary keratome incision was no longer visible in most of them. But these operations were all performed within the last six months, amd so did not warrant positive statements. Mr. TOMLINSON

reminded members that he had shown a case that evening in whom the operation just described was performed by Mr. Herbert, with the knife, last June. Tension was still satisfactory. Mr. NETTLESHIP asked whether there was a family history of glaucoma, as there was reason to think that when it occurred in more than one generation it came on at an earlier age than in the generation preceding. Mr. TREACHER COLLINS said he had performed the operation 40 times since Mr. Herbert's first description, with the knife, and in the large majority there was a satisfactory reduction of tension. But there had been some failures. In two there was prolapse of iris, and in some there was the formation of irido-dialysis in connection with the primary incision, and in some there was adhesion of the iris to the seat of the wound. He suggested an explanation of the improvement brought about by the operation. Mr. MAYOU said he had performed the operation 15 times, and, so far as he knew, the failures had been two. In one of them the tension increased to +3; it was chronic glaucoma, and iridectomy failed to relieve the tension. The other case was one of apparently ordinary glaucoma, in which Herbert's operation was done on two occasions, but the tension was not relieved at either of them. Mr. LAWS, of Nottingham, said he had done the operation on 45 eyes, and it had not failed to relieve the tension permanently and satisfactorily: a strikingly favorable statement, which he could not make about any other glaucoma operation which he had tried. He had also used it in 5 cases of buphthalmos, and in all of them it had proved satisfactory, though in one, an old-standing case, some intraocular hemorrhage occurred but not enough to destroy the eye. It was soft finally. Mr. RIDLEY (Leicester) said he had done the operation on 22 occasions, and, with two exceptions, there was considerable improvement in all. Mr. HERBERT, in replying, invited the reporting of failures following the operation, so that the technique could be perfected as far as possible.

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY, OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. EDWARD B. COBURN, Secretary

MEETING OF FEBRUARY 20, 1911, H. W. WOOTTON, M.D., CHAIRMAN, PRESIDING.

Dr. E. B. Coburn presented a case of **enophthalmos and other ocular symptoms of multiple cranial nerve lesions.** This was a young woman, aged 20 years, who presented an uneventful history up to June, 1910. Then she complained of a severe pain behind the left ear, but without signs of middle-ear disease; this was followed by swelling of the face and much pain. Exophthalmos developed and became pronounced. She is not certain whether the eye was inflamed or not. This condition persisted for four months and was followed by the disappearance of the swelling and exophthalmos and the appearance of a flattening of the face. This was due to a paresis of the facial muscles. About this time she also complained of a buzzing in the ear of the same side, and an aching in the head. By the end of October it was noticed that the left eye appeared to be smaller and the left side of the mouth could not be used in eating, as chewing on that side was painful. The eye did not become actually smaller, but the eye receded into the orbit and the lid drooped so that the palpebral fissure was smaller. There were also some psychic disturbances. Vision became gradually worse in the left eye.

The fundus examination was said to reveal a mild optic neuritis on January 11, 1911, but this is doubtful. Flattening of the face became more pronounced, with drooping of the corner of the mouth and deviation of the tongue to the opposite side. There was loss of sensation of the anterior $\frac{2}{3}$ of

the tongue to sour, bitter, and sweet, and diminution to pain and touch. The cheek was tender to slapping. The pharyngeal reflexes were exaggerated on the left side and the uvula was deviated to one side. Hearing was unaffected. Right grip = 70*kg*, and left grip = 35*kg*. About the first of January the left pupil was larger than the right. There were paræsthesia and itching of the left eyebrow. The left palpebral fissure measured vertically 10*mm*, and the right measured 10*mm*. Vision, O. D. = $\frac{1}{2}\frac{0}{0}$ and O. S. = $\frac{2}{2}\frac{0}{0}$. On the left cornea is a small opacity which has been present since early childhood. This explains, perhaps, the diminished vision, but there is also concentric limitation of the visual field, as shown by a chart that was shown, and with limitation chiefly to the temporal side. At the present time the fundus examination shows no sign of present or past optic neuritis, and there is no change in the blood-vessels. To-day she told me that she had profuse nose-bleed from the left nostril about two years ago. Now she is constipated and suffers from headaches several times a week. She states that she has always been stout, but she seems to be abnormally so now and since the birth of her child seven months ago. There is diminished sensibility of the left lids and conjunctiva, but not of the cornea. The left pupil seems slightly larger than the right. The left pupil dilates more rapidly and to a greater extent than the right after the instillation of cocain and adrenalin. The enlargement of the palpebral fissure is also greater on this side after the use of these drugs. There is marked flushing of the face at times and the sensation of warmth is increased both objectively and subjectively. There has been increased lachrymal, nasal, and buccal secretion on the affected side. Perception of touch, pain, and temperature on the left arm is diminished. Diagnosis: An intranuclear new growth at the base of the brain, probably in the pons. Pressure on the hypophysis accounts for the obesity, and the visual defect is accounted for by pressure on the optic tract.

Dr. H. W. WOOTTON said that the diagnosis might be correct, but that if the tumor pressed on the optic tracts sufficiently to produce visual defects there should be hemianopsia, but this was not shown in the chart of the visual field.

Dr. L. W. CRIGLER presented his case of **rupial syphilis**

involving the eyelid that was shown at a previous meeting. The patient had rupial syphilis, and was treated with salicylate of mercury for one month, and then the lesion on the eyelid developed and the treatment showed no sign of curing the disease. Then three or four injections of cacodylate of soda were made and the lid cicatrized in ten days. In about one month the Wassermann reaction was negative. In December "606" was administered intramuscularly, and in ten days the rupia of the body was entirely healed. Wassermann reaction became positive. Since then the Wassermann reaction has been tried four times and all were negative.

Dr. H. W. WOOTTON said he had used cacodylate of soda on account of some favorable cases he had seen reported in the medical journals. Several cases were treated in this way, but the Wassermann reaction remained positive.

Dr. CHAMBERS said he had employed cacodylate of soda in a supposed case of syphilis. It had been given by the mouth. After a time a hemorrhage occurred at the macula. Treatment was then stopped and Wassermann was found to be negative. Later, tuberculin test gave a positive reaction and the therapy was changed.

Dr. WOOTTON said that Dr. BULL had reported an acute case of arsenical poisoning after treatment in this way.

Dr. S. F. HALLOCK presented a case of **congenital degenerated cataract with peculiar prolongations of the ciliary processes** (?). The patient was a girl aged 18 years, who had congenital cataract and squint since birth. Several glands and ribs had been removed for tuberculous processes. Under normal conditions, the pupils were the same size and responded equally to light. In the pupil could be seen the white membrane of the degenerated cataract. When the pupils were dilated, dark bodies, radially arranged, could be seen coming from the ciliary region and extending to and upon the cataract, to the surface of which they appeared to be attached. These projections were dark brown in color and appeared to be ribbed, and in places a reddish reflex could be seen between them when the eye was illuminated with reflected light. These processes, if such they were, were longer and more marked on the nasal side.

Dr. O. SCHIRMER said that these bodies looked different

from any similar cases he had ever observed. These looked like a surface of pigment, and on that account he did not think they were ciliary processes. Instead, he thought they might be pigment from the posterior surface of the iris. It might also be that they were some congenital malformation.

Dr. E. L. OATMAN said that the ciliary body is *7mm* long and *10mm* from where we see these bodies. It occurred to him that the lens had been swollen and pressed against the iris and the iris pigment had been retained on the lens capsule. He thought it improbable that these were processes when they were three times as long as the ciliary body. In all probability they were pigment masses.

Dr. W. E. LAMBERT coincided with Dr. Oatman.

Dr. HALLOCK called attention to the fact that these bodies were smaller at the lens and increased in size to the outer end. The process may have been intrauterine. There might have been an adhesion of the lens to the ciliary body. He thought it was a congenital condition as the appearances were so sharp and definite. They were not now attached to the iris.

Dr. F. J. PARKER presented a case of **bilateral papillœdema with central scotoma from sinusitis,** and made the following remarks. Central scotoma as an early symptom of accessory sinus disease was first reported by Fuchs and Birch-Hirshfeld. Cases were reported from time to time, but systematic observation of this as a diagnostic symptom followed the work of Onodi, showing the close anatomical relations existing between the accessory sinuses of the nose and the optic nerve, and ophthalmologists have recently had their attention drawn to it as a possible cause of optic neuritis of obscure origin. The patient, a man aged 38 years, had 4 days previously noticed a slight blur before the right eye for far and near which had gradually increased and interfered with his work. Vision with correction was R. $\frac{18}{18}$, and L. $\frac{18}{18}$. Ophthalmoscopic examination showed slight optic neuritis with retinal œdema and venous engorgement. The visual fields were contracted for white, red, and green in both eyes, as shown in the charts. For years the man had been subject to attacks of coryza with pain in the right antrum, but was always relieved by intranasal treatment. Following an attack of the grippe he had an excessive

muco-purulent discharge from the right antrum. An operation of two hours' duration was performed and twelve hours later there was increased pain in the antrum and in the right eye. His eyes were examined three days later and the optic neuritis was found to be more marked and the scotoma larger. The diagnosis of sinusitis was confirmed by Dr. Cutler. He was operated at the Manhattan Eye and Ear Hospital by Dr. Voislawsky. There was no pain or tenderness over the sinus and only slight discharge from the right side of the nose. The next day the right middle turbinal was removed. The optic neuritis and central scotoma were found to have developed further in the right eye and a similar condition was now found in the left eye. Vision was R. fingers at 3 ft. and L. fingers at 20 ft. Six days later the left middle turbinal was removed; two days later the ethmoids were curetted; granulations and pus were found; two days later the double papillœdema was well marked and vision was reduced to the seeing of shadows. Further curetting revealed more cells of the posterior ethmoidal region filled with pus and granulations and the sphenoid sinus was similarly involved. This was followed by great improvement in the vision and in the appearance of the fundus. This continued for a week when the vision dropped in a few hours to the perception of light in both eyes and the increase of the papillœdema. The discharge had entirely ceased. After the use of cocain and adrenalin the sinuses were douched with hot saline solution. Vision returned as rapidly as it had departed. There was steady improvement, but the fields were contracted and there was a central scotoma in each eye. There was no perception of red and green and the fields for white were very irregular. Four months later the fields were larger. The left blind spot was larger than normal and the right blind spot also became enlarged. Still later he had a slight attack of grippe and saw objects red in an indistinct way. The fields now showed a scotoma for red. X-ray plates did not show the involvement of the sinuses. At the time of his admission to the hospital, he had no pain or headache and the nasal examination showed only slight congestion of the middle turbinals with discharge from the right antrum only. The diagnosis was made from the ocular examination. Optic neuritis is not unusual in

sinus cases, but double papillœdema with central scotoma and rapid ocular changes are unusual.

Dr. C. W. CUTLER stated that he saw the case before operation and was convinced that vigorous treatment was necessary. The results obtained were remarkable. Vision is now $\frac{20}{15}$. The only symptom at present is a subjective sense of bluish sparks on moving the eyes, like a Roman candle on forced movements of the eyes. This may be due to old adhesions in the course of the nerve. At one time the fields were reticulated. These small scotomata were perceptible to the patient, but were not measurable by the usual perimetric methods.

Dr. W. B. WEIDLER asked how the increase in size of the blind spot was demonstrated.

Dr. PARKER replied that he used a 5*mm* disk on the perimeter.

Dr. O. SCHIRMER showed a case of **lepra of the eye.** This was a young woman aged 27 years. At 11 years of age she emigrated from the Baltic provinces where her mother had died of leprosy. She had been treated abroad for a stubborn rhinitis, probably the first manifestation of leprosy. The first nodules were not observed until two years after her arrival in America. They developed in the region of the ear, on the arms and hands, and later in the eyebrows. Plenty of bacilli were found in every tubercle. She has now been 7 years under treatment. X-rays had a good effect on the nodules. Injections of nastin during the last year had no effect. Wassermann reaction was strongly positive, and did not become weaker after the administration of salvarsan. The disease was not influenced by the injection. About one year ago an episcleral nodule developed on the left eye at the temporal side at the sclero-corneal margin. When first seen in January, 1910, it looked like a pinguecula, but its yellowish color was darker and the shape was not triangular. Since then it has grown slowly but constantly without irritation and with little pain. The size is now that of a pea and it adheres fast to the sclera. About 12 weeks ago, when it began to touch the cornea, a white opacity of the cornea was observed. It contains few vessels and is considered to be a leprous infection of the cornea. Operative treatment is considered

necessary. The nodule will be removed and the base cauterized. To check further progress of the corneal opacity, a section through the entire cornea in front of the opacity will be made. According to Lyder Berthen, the scar stops with certainty the further progress of the disease.

Dr. E. L. OATMAN discussed the case and said he had seen three cases in one year. All showed ulceration at the corneal margin.

Dr. W. B. WEIDLER asked if this infiltration of the cornea was a proliferation or a new growth.

Dr. SCHIRMER explained that it was an infiltration of the parenchyma of the cornea. The section of the cornea is to produce a scar, and the scar acts as an impediment, the disease never going beyond the cicatrix. X-rays had been suggested, but he was not anxious to try them as it might cause a keratitis. He had seen a number of cases caused by their use.

Dr. C. W. CUTLER asked if the appearance shown in this case was characteristic. He had seen cases of sarcoma closely resembling the present one.

Dr. SCHIRMER replied that these cases have a very slow course. This one seems to correspond to the description in the literature of the subject. It is quite typical.

Dr. OATMAN remarked further that all these cases look like tuberculosis. Some show nodules in the iris.

Dr. H. H. TYSON asked if there were any ophthalmoscopic changes visible in the fundus.

Dr. SCHIRMER concluded by saying that there were no retinal changes in the case just shown. If any, they appear in the uveal tract. Later, the opacity of the cornea prevents any examination of the fundus.

Dr. H. H. TYSON presented a case of **quinin amblyopia.** This was a young colored man, 23 years old, who was seen at the Vanderbilt Clinic and complained of his narrow fields of vision. It seemed as if he were "looking through a gun-barrel." A year previously, while living in Virginia, he had typhoid pneumonia and was given quinin in 20-grain doses in capsules. The next day he was given 80 grains and four hours later 40 grains more, making 120 grains during the day. The next morning he could not see, so his mother gave him 20 grains additional. A physician examined him with lighted

matches and candles, but he was totally blind. He had no deafness, but tinnitus was present. At the end of a week he had perception of light, and vision gradually returned until he had good central vision but with restricted fields. Under strychnin he improved slowly. Fourteen months after taking the quinin he came to the Vanderbilt Clinic. Vision was R. $\frac{20}{10}$ and L. $\frac{20}{10}$. The visual fields were narrowed to about 5 degrees around the point of fixation. There was no field for colors. The pupils were sluggish to light but responded, consensually, to accommodation and to convergence. The sensibility of the cornea was diminished. The fundus examination showed absolute whiteness of the optic disks. The veins and arteries were narrow and contracted, with sclerosis of the vessel walls and obliteration of the nasal branches of the artery. Treatment began with iodide of potash and strychnin. The visual fields increased and small islands of vision appeared in the blind fields. As the treatment continued, the fields expanded more to the temporal side and embraced the islands seen previously. In February the fields were found to be extending into the superior temporal quadrant. The points of interest in this case are: (1) Excellent central vision, $\frac{20}{10}$, with the fundi presenting apparent total atrophy of the optic nerves. (2) Course of the disorder, viz., total loss of vision followed by restoration of sight, with secondary diminution of vision followed by late but secondary improvement of vision both central and peripheral especially toward the temporal side. (3) Sclerosis of the retinal vessels, which is evidently a late manifestation, as it is in other disorders in which ganglion and nerve-fibre layer degeneration are present. Holden in his experiments on dogs found contracted vessels but no changes in the vessel walls as late as the seventh week. Further, it was thought that as irreparable damage to the retina was done in the first day or two after the toxic dose, it was concluded that remedial effects would be secured only by immediate treatment. This patient shows improvement 21 months after the toxic dose. (4) Islands of vision appeared in parts of the field in the direction in which the fields later widened so as to absorb them. (5) The color fields improved only slightly.

Dr. W. M. LESZYNSKY discussed the case and said this

was another demonstration of the cases that have normal vision but with apparent atrophy. He showed a case with Dr. Webster ten years ago. The boy had basal meningitis with optic neuritis followed by post-neuritic atrophy. Vision was normal. In the present case the nerve appears whiter by contrast as the patient is a negro.

Dr. F. J. PARKER referred to a similar case of quinin amblyopia seen by him. In that case the columns of blood in the vessels were broken and there were marked vascular changes. In one night the patient took 240 grains of quinin.

Dr. J. H. CLAIBORNE said that cases had been reported in which blindness had resulted from the ingestion of from 15 to 30 grains. These cases seldom become completely blind. The vessels are very narrow and the optic disk white.

Dr. E. L. OATMAN asked if there was not still some capillary circulation around the disk.

Dr. CLAIBORNE stated that he had known of a case in which 60 grains had produced a toxic effect.

Dr. H. W. WOOTTON reported a case in which 30 grains caused amblyopia.

Dr. TYSON concluded by saying that as small a dose as 12 grains had caused ocular symptoms. In such cases there is probably some idiosyncrasy. The quantity which is usually found to produce a toxic effect is over 45 grains.

Dr. H. W. WOOTTON presented a case of **traumatic enophthalmos.** The man had been struck on the forehead with a black-jack 3 or 4 months ago. Since that time there had been a recession of the eye into the orbit. Such a condition may be due to enlargement of the orbit from fracture of the bones, an escape of the orbital contents, or to paralysis of the sympathetic, or to absorption of the orbital fat. In this case he thought there had been a fracture of the orbit. The vision was $\frac{20}{30}$, with no diplopia and no changes in the fields of vision.

Dr. W. B. WEIDLER presented a case of **traumatic paralysis of the orbicularis palpebrarum.** The patient, a male aged 38 years, was assaulted and found unconscious. When seen three weeks later there were five scars on the left side of the face, two in front of the ear, and three involving the jaw and neck. Two days after the accident he was unable

to close the left eye. There was no reaction to light, accommodation, or convergence. The right pupil measured 5.5*mm*, with vision $\frac{20}{20}$, and the left pupil measured 8*mm*. There was present a divergent squint of 25°, but this was old and of long standing. There was partial facial palsy but not marked. He could whistle. The cornea looked dry where exposed by the lagophthalmos. On ophthalmoscopic examination there was seen a small, round, central, posterior opacity of the lens, with a small band-like opacity extending upwards and inwards in the retina. The vitreous showed "powder-like" opacities. From the nerve-head there was a grayish white mass beginning at the lower half and extending to the nasal side. To the macular side of the disk is a large, whitish blue, irregular-shaped tissue formation extending outwards. The disk margins were blurred and the arteries were small and narrow. The superior temporal branch was obscured by the mass of tissue formation. Throughout the periphery of the fundus were great quantities of irregular-shaped pigment spots. As the paralysis had existed over three weeks without treatment there was not much hope of great benefit from treatment. Nux vomica caused some improvement and boric acid wash and dark glasses were also prescribed. Local electric applications with the faradic and galvanic currents, together with massage, were continued over five months. The Wassermann test was positive, so KI was administered. The previous choroidal trouble of 14 years previously was undoubtedly syphilitic. There was also a clear history of chancre. A tremor-like movement of the lids and brow was the first sign of returning function. There is now slight motion to the lower lid, and the upper lid now comes down so far that there is no longer danger of ulceration of the cornea. The inner fibres of the orbicularis are the last to recover and this is true in this case.

Dr. E. T. SMITH reported a case of **epithelioma of the eye,** with exhibition of specimen. This patient, aged 70 years, gave a history that for about four months something had been growing over his left eye. Upon examination there was an irregular, firm, warty-appearing mass about the size of a pea, occupying the outer and lower two-thirds of the cornea of the left eye. This also encroached somewhere on the sclera

below and at the outer side. This growth was removed under local anæsthesia and was found on microscopic examination to be an epithelioma. Six months later the patient returned with a recurrence somewhat larger than the original tumor. The eye was therefore removed.

Dr. J. H. CLAIBORNE read a paper entitled **A hitherto undescribed sign in retinoscopy.** He described the usual methods of performing retinoscopy by making vertical and horizontal movements of the mirror and observing the behavior of the shadow in the pupil. In the method which he now proceeded to describe, the mirror was given a circular movement and conclusive deductions could be drawn from the behavior of the shadow under these conditions. In emmetropia, as well as in hypermetropia, the shadow appears on the side opposite that in which the light is thrown, and proceeds to move in a circular path in the pupil but always in the quadrant opposite that in which the light is thrown. The movement of the shadow is in the same direction as the motion of the mirror. Dr. Claiborne explained that it was with the concave mirror with which he was accustomed to perform this test. In hyperopic astigmatism and in compound hyperopic astigmatism, the shadow moved slower and was darker in the meridian of greatest ametropia, and moved faster and was brighter in the meridian of least error. In myopia and in compound myopic astigmatism, the shadow appeared in the same quadrant as that in which the light was thrown, and continued to travel with the movement of the mirror always in the same direction and in the same quadrant. In compound myopic astigmatism, the shadow was darker and moved slower in the meridian of greatest myopia, and moved quicker and was brighter in the meridian of least refractive error. In cases of mixed astigmatism the shadow moved in a direction opposite that of the motion of the mirror.

Dr. F. J. PARKER opened the discussion and asked if a mydriatic was used.

Dr. CLAIBORNE explained that he generally used a mydriatic, but that in high degrees of hypermetropia a mydriatic was scarcely necessary.

Dr. L. EMERSON said that he had used the plane mirror in this same way and confirmed the report of Dr. Claiborne.

Instead of standing at one metre distance from the patient, he was accustomed to stand at one-half metre distance and deduct 1½ D. from his findings. This was more convenient, as then he had no difficulty in changing the lenses.

Dr. E. B. COBURN said that he had made some experiments with this method by using lenses in front of the patient's eye and so simulating in this artificial way the various optical conditions. He was able to confirm all that had been said, but was of the opinion that the old method was preferable. The term "Photoscopy" was preferred to "Shadow Test" as it was the bright fundus reflex that was observed rather than the shadow.

Dr. CLAIBORNE said he prefers to watch the shadow and hence prefers the term "Shadow Test."

Dr. F. VALK said he had used retinoscopy long before with Dr. Bull of Paris. He explained the formation of the shadow as being formed by the light spot cast on the retina by the retinoscopic mirror. He therefore prefers "Photoscopy."

Dr. H. H. TYSON said he also watched the light spot on the retina rather than the shadow.

Dr. R. C. DENIG read a paper on **transplantation for trachomatous pannus.** Transplantation for trachomatous pannus had been performed by Denig nine times with gratifying results. In all of the cases medical or surgical treatment had failed to bring relief. The operation is performed as follows:

After subconjunctival injections of cocain have been made in several places, the conjunctiva with subconjunctival tissue is carefully excised as near to the limbus as possible, beginning at the temporal or nasal side of the cornea, a little below its horizontal diameter, and ending in a corresponding place on the opposite side. The excision should be of elliptic shape and may extend at its apex to 10*mm* or more. Care should be taken to lay the sclerotic entirely bare. This being done a suitable flap is provided either from the mucous membrane of the lips or from the skin. Denig has made use of lip flaps eight times and of skin flaps only once. Cases of pannus covering the whole cornea will require several flaps all around the cornea. The transplantation may perhaps also be done in cases of scrofulous pannus.

Dr. E. B. COBURN asked how the lip flaps were prepared.

Dr. DENIG said the flaps were obtained from the inside of the lips.

Dr. H. W. WOOTTON remarked that this operation seemed to be a peritectomy with flaps.

Dr. M. COHEN asked how long ago these cases had been operated upon.

Dr. DENIG replied that they were done last October.

Dr. J. H. CLAIBORNE thinks the pannus due to old trachoma and chronic conjunctivitis. He referred to the Heisrath-Kuhnt resection and thought it preferable to this operation, but both might be done.

Dr. T. R. CHAMBERS asked whether the cautery would not be successful.

Dr. DENIG said that the cautery did not always produce the desired effect.

Dr. WOOTTON thought this operation of transplantation might be employed after the combined excision has failed. The cautery is not reliable and the results are not permanent. He thinks if the pannus is due to infection or to thickening of the tarsus then the operation would not be successful.

The Secretary, Dr. E. B. COBURN, then read the resolutions that he had been directed to prepare relative to the deaths of Dr. C. Cole Bradley and Dr. C. J. Kipp.

WHEREAS, It has pleased an All-Wise Providence to remove from our midst Dr. C. Cole Bradley, an esteemed colleague, an able physician, and a Fellow of the New York Academy of Medicine, be it

RESOLVED, That the Section on Ophthalmology of the New York Academy of Medicine hereby expresses to the bereaved relatives and friends its heartfelt sympathy and condolence for the loss which they have sustained, and at the same time desires to express its own sorrow and regret at the loss of a co-laborer in the field of medicine and for the relief of human suffering; and be it further

RESOLVED, That these resolutions be spread on the minutes of the Section, and a copy of them be sent to the family of the deceased.

Dr. F. VALK spoke feelingly of his acquaintance with Dr.

Bradley and moved that the resolutions be adopted. This was seconded by Dr. CLAIBORNE and the resolutions were adopted.

The Secretary then read the following resolutions:

WHEREAS, It has pleased Almighty God, in His inscrutable wisdom, to remove from amongst us Dr. Charles J. Kipp, an esteemed colleague, an able physician, and a Fellow of the New York Academy of Medicine, be it

RESOLVED, That the Section on Ophthalmology of the New York Academy of Medicine hereby expresses to the bereaved relatives and friends of the deceased its heartfelt sympathy and condolence for their great loss and sorrow, and at the same time the Section deplores the loss of his wise counsel and deprivation by his death of his contributions to science and the public welfare; and be it further

RESOLVED, That these resolutions be spread upon the minutes of the Section and a copy of them be forwarded to the family of the deceased.

Dr. H. H. TYSON moved that these resolutions be adopted and this was seconded by Dr. CLAIBORNE. The resolutions were unanimously adopted.

MEETING OF MARCH 20, 1911, DR. H. W. WOOTTON, CHAIRMAN, PRESIDING.

Dr. E. M. ALGER presented a case of **Parinaud's conjunctivitis.** The patient was an Italian girl aged 14 years who complained that the left upper eyelid was swollen and drooping. Examination showed considerable swelling and redness of the left upper lid, and just above the external canthus a shot-like nodule which was somewhat tender was observed. There was also pronounced swelling and tenderness of the preauricular gland. Eversion of the lid showed a condition very suggestive of trachoma, the conjunctiva being studded with granulations, especially toward the outer canthus. At this point there were several small ulcerations which later coalesced into one. The other lid and the other eye were normal and the subjective symptoms were much less than in a trachoma of similar severity. The swelling of the preauricular glands increased and the cervical and submaxil-

lary glands were also increased in size. The lid condition has remained unchanged except that some yellowish points have appeared in the conjunctiva and a small abscess. The condition is evidently not trachoma, and the process is too acute to be an initial specific lesion. Smears showed only staphylococcus pyogenes aureus and albus. No evidences of sporotrichosis were found. The treatment has consisted of applications of nitrate of silver, 1%, several times a week. Argyrol in 10% solution was prescribed for home use and iodide of potash was administered internally. The improvement in the glandular swelling appeared soon after the use of the iodide.

Dr. J. E. WEEKS opened the discussion and stated that these cases have distinctive characteristics. In the sulci of the elevations there is a necrotic condition of the epithelium and, frequently, small abscesses are seen. These are just below the epithelial layer. Treatment is most unsatisfactory, and consists of irrigations with boric acid solution or bichloride of mercury every two or three hours and dusting in of calomel. The general health should also be attended to. The disease may run two or three months before a cure is effected. The cause is as yet undetermined, as no specific organism has as yet been isolated. The cornea is occasionally affected, and of this type he has seen two cases.

Dr. E. B. COBURN presented a case of **lipoma of the conjunctiva.** This was observed in an elderly woman who said she had noticed it for about two years and that now it was increasing slowly in size. The tumor was a flat, movable growth, covered with conjunctiva and having a whitish or yellowish-white appearance. It was situated over the insertion of the inferior rectus muscle and extended up to the sclero-corneal margin. It was probably a lipoma. These are usually simple lipomas or lipomatous dermoids, and are usually situated on the outer side between the external and superior rectus muscles. He purposed removing the tumor at an early date.

Dr. E. B. COBURN presented also a case of **double choked disk from suspected brain tumor.** This was a young Hebrew boy, aged 14 years. His father and mother had both been troubled with headaches. He had been hit with a ball over

the right temple and had also cut his head by running into another boy when he was much younger. A scar can still be seen over the right supraorbital crest. His present illness began 9 months ago with severe headaches. Five months ago he was examined by a physician and was told to secure glasses and has been wearing lenses ever since. His headaches are frontal and bilateral and often come on during school hours, accompanied with vomiting. The last severe attack was three weeks ago, with severe headache and vomiting. Examined by Dr. Dana as follows: Cerebellar attitude, head held to one side, slight movements of the body and some tremor of the hand and mouth and facial twitching, choreic movements of body and tongue, no nystagmus. His knee-jerks were diminished and his mother says his memory is poor. He was examined by me and found to have double choked disk, the nerve being swollen about 4 D. On May 27th he was examined by Dr. Hunt. At that time he had no headache, but the patient was stuporous. There was facial tremor on the left side and the choreiform movements still persisted. June 10, 1910, his mother says he is disobedient and gets frightened easily. Has had no headaches or vomiting recently. October 21st, his headaches are very slight and he has returned to work. Fundus examination by me shows that the swelling of the optic nerves is decidedly less. At the present time the right nerve is only slightly swollen and the left nerve appears practically normal. The visual fields and visual acuity have been normal at all times during the course of his optic nerve involvement. The laboratory report shows a trace of albumen in the urine. The Wassermann, Noguchi, and Weil reactions were negative. His treatment has consisted largely of iodide of potash.

Dr. W. M. LESZYNSKY began the discussion and said that he had shown here a boy, aged 16 years, with bilateral papillitis and with headache and no localizing symptoms. A double occipital craniotomy was performed, but the boy died. The chief indication for decompression operation is the failure of vision in the presence of choked disk. He also reported another case with double choked disk and diminished vision. There were no localizing symptoms. A subtemporal decompression was performed and with remarkable results.

The improvement was evident in a week or ten days, and the vision, which was reduced to counting fingers at 5 feet, had risen to $\frac{15}{100}$ and the other eye had good vision. The swelling of the nerve had now subsided.

Dr. W. P. EAGLETON said that the subsidence of the swelling of the optic nerves was very strange if this was a case of brain tumor. He had seen a similar case occurring in a man in whom the optic nerve swelling receded for 18 months and then the patient died. He has three specimens, in all of which the patient went blind and all showed tumor. Two were pronounced by neurologists to have no tumor. He has done several decompressions, of which one has died. Some cases show remarkable improvement. He has one case now of tumor of the acoustic nerve which has been afforded much relief by operation. The relief occurred in two days after the operation. He expects to operate soon on the opposite side. He referred also to a man who became blind but was able to recognize faces at several feet distance after the operation. It is almost criminal if we do not operate to save sight. An optic neuritis that increases should be operated.

Dr. A. DUANE asked if subsidence of the swelling of the optic nerve meant absence of tumor. He reported a case with double optic neuritis and headache. There was bilateral hemianopsia of irregular type. The patient became entirely well with small doses of iodide of potash and mercury. The recovery took two or three months. The vision and fields remained normal for about a year and then the symptoms returned and gradually increased. Motor symptoms due to pressure developed, but they were differently localized. The patient eventually became blind and died. There was no autopsy.

Dr. L. W. CRIGLER presented a case of **tuberculosis of the choroid after six weeks' treatment with tuberculin.** This was a girl aged 17 years, whose sight began suddenly to fail, with numerous black spots floating in the field of vision. There was no pain or redness of the eye at any time. The patient was well nourished and in apparently good health. Her mother had died of tuberculosis. When first seen there was the appearance of a typical cyclitis, with deposits on Descemet's membrane in triangular form. The vitreous was

cloudy and the vessels obscured. Vision was $\frac{20}{100}$; von Pirquet's test was positive, a systemic reaction following the inoculation. It was impossible to tell whether there was any local reaction or not. A diagnosis of tuberculous choroiditis was made and injections of $\frac{1}{10.000}$ *mg* of tuberculin were made. The injections were made three times a week, and in all eighteen injections have been given. Her vision now is $\frac{20}{30}$ + with correction. The vitreous is quite free from opacities, and the outlines of the inflammatory process are easily seen occupying a circumscribed area in the retina and choroid in the inferior nasal zone. The area involved is larger than usually seen, and the pigment changes external to the two destructive foci may be taken to be the result of a reactionary inflammation. This case seems to illustrate the potency of tuberculin in combating this form of ocular disease.

Dr. J. E. WEEKS opened the discussion and said that the question of diagnosis of tuberculosis of the eye should be better understood. He emphasized the necessity of a local reaction after the inoculation with tuberculin for diagnostic purposes. The von Pirquet and Calmette reactions simply indicate a tuberculous focus somewhere or anywhere in the body. He knows of three cases of von Pirquet's test that gave local reaction. The general reaction is not so often observed with von Pirquet's test as with the subcutaneous skin test. He has had 16 cases of tuberculosis of the eye up to the present time. The improvement in these cases after treatment with tuberculin is marked. A case shown at the New York Ophthalmological Society and apparently cured at the end of nine months with 45 to 50 injections had a relapse and was treated again, with disappearance of the inflammatory symptoms. In the case shown to-night there appears to be still some haziness around the exudative focus, indicating that the process has not yet been entirely cured. The doses are larger than he is accustomed to give. He questioned whether it was advisable to administer the dose oftener than every five days.

Dr. E. B. COBURN presented for Dr. T. R. POOLEY a case of **deposits on the lens capsule, probably tuberculous.** This was a young girl, aged 9 years, who was healthy at birth. Three members of her father's family died of tuberculosis.

Her father and mother are healthy. Mother had two miscarriages previous to the birth of this child. Mother has at present a subacute laryngitis. The child's eyes became affected at the age of three years, when she was brought to the New Amsterdam Eye and Ear Hospital and a diagnosis of double parenchymatous keratitis was made. She was treated at that institution for several months and afterwards by the family physician. About this time the cervical glands on the right side became enlarged and subsequently those on the left side. She was operated four times at St. Mary's Hospital and the glands removed. The facies show typical inherited syphilis. Status Præsens: The right eye has several posterior synechiæ and two nodules of a yellowish color, one on the upper and inner part of the lens capsule, and the other on the upper and outer part of the lens capsule. The larger of these nodules on the nasal side is attached by a slight thread to the iris. Tuberculin and Wassermann tests were made at the Cornell Laboratory and both reported negative. The history and the extensive involvement of the cervical glands lead us to suspect that these deposits in the pupil are tuberculous.

Dr. J. E. WEEKS said these deposits resemble two cases of tuberculous iritis that he had seen, and strongly suggest that probability.

Dr. H. H. TYSON presented a case of **tuberculous keratitis** appearing in a young man aged 19 years. About two years ago he came to the Clinic because of inflamed eyes and a diagnosis of tuberculous keratitis was made. Von Pirquet test was positive. He received an injection of tuberculin and next day his temperature was 105°. This receded gradually and became normal at the end of five days. Injections were then made twice a week for six months. His left eye cleared up three weeks after the first injection. About one month later it again became inflamed and then gradually cleared during the remainder of the treatment. About the time of the discontinuance of the injections he noticed that his cervical glands were slightly enlarged but not painful. About six months later he had the glands removed at Roosevelt Hospital and they were found to be tuberculous. About five weeks ago his right eye became diseased, and on coming to the

Vanderbilt Clinic he complained of photophobia and lachrymation. His eye presented a typical picture of tubercle of the cornea. The Morro and von Pirquet tests were strongly positive. A Wassermann test was negative. The treatment now consists of atropin and hot applications, and a course of tuberculin injections has been started.

Dr. H. W. WOOTTON said that he had treated a case similar to the one just shown. Von Pirquet was positive. The result of the injections of tuberculin was almost miraculous. When the dosage had reached $\frac{1}{1000}mg$ the patient was practically cured, but suffered a relapse, nevertheless, and four or five more completed the cure.

Dr. I. M. HELLER presented a case of **tuberculous choroiditis,** appearing in a man aged 21 years. He suddenly discovered that he could not see with one eye, and as he had no pain or other signs of inflammation he thought glasses would restore the sight. In the fundus of the right eye was an old macular choroiditis with considerable pigment deposits. In the left eye was an exudate almost covering the disk, and to the temporal side was an irregular pigmented area as if a recent hemorrhage had occurred. The fields showed general contraction and absolute central scotoma. He was given atropin and KI and a good course of sweating without apparent benefit. There were then some ciliary injection, slightly inflamed iris, deposits on the posterior surface of the lens, and vitreous opacities. Mercury was added to his other medicines. Dr. Skeel confirmed the diagnosis of uveitis and choroiditis and advised the continuance of the treatment. A trip to the country benefited his general health, but he returned with his vision limited to the perception of large forms at 2 ft. The fundus could not be seen with the ophthalmoscope because of floating opacities and haziness. Von Pirquet's test was now found to be positive, and injections of $\frac{1}{10,000}mg$ of bacillus emulsion were made. Beyond a feeling of drowsiness and a tired feeling there was no reaction. His temperature was always about normal except during an attack of grippe which developed intercurrently. He had in all 43 injections, and the last dose was $50mg$ of the emulsion. His condition has markedly improved and he now sees large objects quite clearly. The atrophic area near

the disk can now be seen with the ophthalmoscope. If the disease in the other eye was of a similar character some years ago and was cured spontaneously, the question then arises, Of how much benefit has been the tuberculin injections? It must be remembered that no progress was made until the injections were begun.

Dr. H. W. WOOTTON said that he gave injections every three days.

Dr. J. E. WEEKS remarked that in tuberculous infiltration of the cornea the foci were usually small. They need not be grayish in color but are often whitish. The vascularization is often marked and extends from the sclero-corneal margin to the spots.

Dr. C. H. MAY continued and said that he had used tuberculin without grave reactions in general but wished to report the following case. A patient with tuberculous iritis and with von Pirquet's test positive was given an injection of Mulford's tuberculin with a dose of $\frac{1}{1000}$. The nodules were well marked. Thirty-six hours later there was a violent reaction. The vitreous became hazy, the lids swelled, the iris discolored, Descemetitis, pain, and the eye sightless. Sedatives were necessary to relieve the pain. The injection was not repeated. These alarming symptoms subsided, and the eye was cured, although the patient has general tuberculosis, with one injection. It is barely possible that the dose was larger than that prescribed, although the house physician was carefully instructed how to dilute and inject the tuberculin.

Dr. A. DUANE asked if there was any general reaction.

Dr. MAY replied that the temperature rose to 100°, but not otherwise.

Dr. L. W. CRIGLER said that the temperature in his case went to 100°, but he delayed the injection until the temperature was normal.

Dr. E. S. THOMSON presented a case of **choroidal sarcoma of the posterior segment, with description of the ophthalmodiaphanoscope.** (To appear in full later.)

Dr. J. E. WEEKS said that the instrument was of value in tumors far back in the eye. The ordinary lamps are efficient and we need not use this one. It is cumbersome, but

the illumination is fine. Tumors can be diagnosticated even if cataract is present.

Dr. W. B. WEIDLER presented the report of a case of **neuroparalytic keratitis, with exhibition of specimen.** The patient, a woman aged 58 years, complained of severe facial neuralgia. As there was no improvement in over a year, the Gasserian ganglion was removed. The operation was entirely successful as the neuralgias were completely relieved. There were no changes noted in the eye, but she was advised to wear a shield over it. About a year and a half later she complained of great pain in the eye. The lids were swollen, considerable discharge, marked injection of the tarsal and bulbar conjunctiva. The cornea was ulcerated, the area of ulceration involving two-thirds of the central portion. It was deep and opaque. The anterior chamber presented a small hypopyon. The iris was discolored, and posterior synechiæ as the iris dilated irregularly under atropin. Vision was reduced to counting fingers at three feet. There was much pain in the temple and in the eye. The treatment was boric acid solution, atropin, dionin, and hot compresses, together with iron and strychnia internally. The acute symptoms subsided slowly and repair of the cornea was very slow. Eventually the eye was removed. On microscopic examination the cornea was found to be much thinner in the centre, the site of the ulcer. The anterior chamber shows nothing unusual, but the anterior surface of the iris is grayish-white and the stroma is thin and atrophic. There is marked absorption of the choroidal pigment.

Dr. A. DUANE said he had seen an allied condition with paralysis of the fifth nerve after hemiplegia two years previously. The patient had recurring attacks of blurring of the sight and pain. He had seen two attacks. There are small erosions of the cornea visible. They can be seen best from behind with natural light. They look like pin-pricks or gouges and do not stain well with fluorescin. There is a distortion of the corneal reflex. Relief is obtained with dionin and 1% acoin in castor oil. It is probable that the anæsthesia of the cornea rendered these erosions possible. Vision during the attacks was $\frac{4}{10}$ and after the attacks was $\frac{8}{10}$. If sufficiently large they might coalesce and form one large vesicle.

Dr. E. B. COBURN asked what the tension was during the attack.

Dr. W. B. WEIDLER asked if sensation was diminished and was the secretion of tears affected.

Dr. DUANE replied that the tension was from 15 to 20*mg* of mercury. The tears flowed the same, but there was anæsthesia of the cornea.

At the Executive Session that followed, the Chairman spoke of the efforts which are being made by optometrists to disparage and belittle the work of oculists, and called attention to the course in optometry which had been started in the Department of Physics at Columbia University.

The question was discussed by a number of the Fellows and the following resolutions were adopted:

WHEREAS, Columbia University has established a course in optometry which is recommended to all persons without regard to age or previous education; and

WHEREAS, This course does not include instruction in general anatomy, physiology and pathology, and practical ophthalmoscopy; and

WHEREAS, Many eye diseases and disturbances of vision which lead persons to seek relief by the use of glasses are but the outward expression of general pathological conditions of the body or of the eye itself; and

WHEREAS, The use of a mydriatic is often an essential and necessary part of the examination of the eyes, and such use of drugs is prohibited by law to all except graduates of medicine; be it therefore

RESOLVED, That the Section on Ophthalmology of the New York Academy of Medicine deplores the action of Columbia University in establishing this course in optometry, and protests against the graduation of such incompetent and imperfectly educated individuals to examine the eyes, and condemns this approval of Columbia University of this usurpation of the law-given rights of the Medical Profession, because the false sense of security thus engendered in the public mind will react to its harm and detriment; and be it further

RESOLVED, That these resolutions be sent to Columbia University and to the Dean of its Medical Department.

These resolutions were ordered sent to the Council and President of the New York Academy of Medicine, with the request that they be referred to the Fellows at the next stated meeting of the Academy, and when approved by them that they be sent to the President of Columbia University and to the Dean of its Medical Department.

A motion was also carried that a committee of three be appointed by the Chair to further consider means of resisting and fighting the optometry evil.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST AND SECOND QUARTERS OF THE YEAR 1910.

By Dr. G. ABELSDORFF, in Berlin; Prof. ST. BERNHEIMER, in Innsbruck; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin; with the assistance of Prof. A. ALLING, New Haven; Prof. E. BERGER, Paris; Prof. CIRINCIONE, Genoa; Dr. DALÉN, Stockholm; Prof. HIRSCHMANN, Charcow; Dr. J. JITTA, Amsterdam; Mr. C. DEVEREUX MARSHALL, London; Dr. H. MEYER, Brandenburg; Dr. P. VON MITTELSTÄDT, Metz; Dr. H. SCHULZ, Berlin; Prof. DA GAMA PINTO, Lisbon; and others.

Edited and Translated by Dr. MATTHIAS LANCKTON FOSTER.

(*Continued from page* 355.)

Sections VIII.–XII. Reviewed by DR. SCHWEIGGER, Berlin.

VIII.—LIDS.

62. HENDEL, PAUL. **Vaccination injuries of the eyes.** *Inaug. Dissert.*, Rostock, 1909.

63. v. HEUSS. **A case of alternating superficial necrosis of the skin of the lids of both eyes, probably of hysterical origin.** *Archiv f. Ophthalmologie*, lxxiv., p. 388.

64. ELSCHNIG, A. **The operative treatment of ptosis.** *Mediz. Klinik*, 1910, No. 20.

65. BLASCOVICS, L. v. **Plastic operations on the margin of the lid.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., 1, 3, p. 334.

66. MEYERHOF, MAX. **Plexiform angioma of the eyelids.** *Ophthalmic Record*, June, 1910.

HENDEL (62, **Vaccination injuries of the eyes**) describes a vaccine blepharitis in a freshly vaccinated two-years-old child, and in a woman who had got lime in her eye and then had a vaccine infection of the lid which caused an extensive swelling of the face, but healed perfectly. Of the 40 cases

of inflammation of the eye met with in a million of vaccinated persons, the pustules are situated only on the lid skin in 15%, on the margin of the lid in 75%, whence they sometimes spread into the conjunctiva. In the conjunctival sac a pustule can hardly be seen, but rather a superficial loss of substance that has a diphtheritic appearance and heals without a true scar. There is fever and the preauricular glands are swollen, and there is danger of corneal infection. The latter appears early as an ordinary ulcer, or harmless loss of substance, or in a later stage as a deep, central, disk-like opacity with epithelial markings, but not identical with Peters's keratitis disciformis, which is met with only after herpes or a traumatism.

v. Heuss (63, **A case of alternating superficial necrosis of the skin of the lids of both eyes, probably of hysterical origin**) describes a case of this nature met with in a girl 21 years old. During a period of 7½ months there were 9 attacks alternating between the two eyes. Treatment was symptomatic and without influence on the course of the trouble. The etiologic and diagnostic interpretation of the case was attended by great difficulties. There was no vesicular eruption or neuralgia to indicate the presence of herpes. As the patient was plainly hysterical the eye disease was assumed to be hysterical, although such necrotic processes in the lid of hysterical origin have never before been reported. Binswanger saw a similar case of herpes zoster gangrenosus hystericus. v. Heuss sees in this eye affection the impression of a tropho-neurotic disturbance in the field of the first and second branches of the trigeminus caused by a hysterical general disease.

Elschnig (64, **The operative treatment of ptosis**) performs his operation of advancement of the levator in incomplete ptosis always with a result equal to a third of distance closed by suture and without production of injury. For complete ptosis, when there is no action of the levator, he finds Hess's operation uncertain in the final result. Motais's operation gives better associated movement of the lid and globe and the effect may often be increased by the excision of a strip of the lid throughout its entire extent and thickness 3 or 4*mm* broad, but this again gives rise to the danger of lagophthalmos. Motais's operation is impossible when the superior rectus is absent

or is too weak, as frequently is the case in congenital ptosis. In such cases attempts should be made to strengthen it by use.

BLASCOVICS's (65, **Plastic operations on the margin of the lid**) paper is a contribution to the operative treatment of trichiasis. He distinguishes between displacement of the eyelashes in consequence of blepharo-adenitis, in which the tarsus remains normal, and the cicatricial entropion of trachoma, in which the tarsus is involved and is deformed. In the latter case the best manner in which to replace the margin of the lid in its correct position is by Kuhnt's operation of shelling out the tarsus. Blascovics has done this operation with the best results in a large number of cases. But this procedure is of no avail when the trichiasis is due to blepharo-adenitis. Transplantation of mucous membrane does not seem very suitable because of the red edges of the lids that it leaves behind. He recommends and describes his own operation, with which he is greatly pleased. Its principle is to shove islands of skin adherent to their subjacent tissues beneath the base of the cilia after it has been dissected up in the form of a bridge, and to fix them in place by sutures. He has performed this operation nine times in cases of partial and total trichiasis with good cosmetic result. K.

The tumor described by MEYERHOF (66, **Plexiform angioma of the eyelids**) occurred in a 16-year-old girl and had grown for six years, although the writer considered it to be of congenital origin. It involved the entire left upper lid and temporal part of the lower. Two operations with the actual cautery failed, but excision gave a good cosmetic result without recurrence. Microscopically it was a plexiform angiofibroma. BLAKE.

IX.—LACHRYMAL APPARATUS.

67. MARX, H. **A rare cause of epiphora.** *Arch. f. Ophth.*, lxxiv., p. 517.

68. FLEISCHER, B. **Relations of Miculicz's disease to tuberculosis and pseudoleucæmia.** *Klin. Monatsbl. f. Augenh.*, xlviii., p. 289.

69. IGERSHEIMER, J., and POELLOT, W. **The relations of Miculicz's disease to tuberculosis and the way of infection in tuberculous disease of the lachrymal gland.** *Arch. f. Ophthalmologie*, lxxiv., p. 411.

70. MENDEZ. **Gumma of the lachrymal gland.** *Klin. Monatsbl. f. Augenh.*, xlviii., 1, 5–6, p. 533.

71. Brose, L. D. **Lachrymal gland tumors.** *Jour. A. M. A.*, Feb. 12, 1910.
72. Kiehle, F. A. **A case of dacryops.** *Ibid.*, Feb. 12, 1910.
73. Elliot, R. H. **Two cases of pneumocele of the lachrymal sac.** *Ophthalmology*, April, 1910.

Marx (67, **A rare cause of epiphora**) saw two cases of epiphora which were caused by the pressing upward of the floor of the nose by a dental cyst and so mechanically interfering with the outflow. This rare cause of epiphora has never before been observed. K.

Fleischer (68, **Relations of Miculicz's disease to tuberculosis and pseudoleucæmia**) saw four cases of Miculicz's disease in young patients who recovered in spite of severe symptoms. All four exhibited, beside the typical swellings of the lachrymal, salivary, and lymphatic glands, positive clinical and anatomical symptoms of tuberculosis: pulmonary tuberculosis, conjunctival nodules, epitheloid cell nodules in the substance of the lachrymal and submaxillary glands, and tuberculosis of the iris. In spite of the absence of tubercle bacilli the anatomical findings in the histological preparations rendered the diagnosis certain. He agrees with Meller that in many cases of Miculicz's disease a peculiar, modified, and usually benign form of tuberculosis is present. A connection between Miculicz's disease and true pseudoleucæmia he considers not proven; on the contrary, the conditions that simulate clinically a pseudoleucæmia are in fact, according to the modern views of pathologists, a peculiar, generalized tuberculous affection of the lymphatic glands. K.

Igersheimer and Poellot (69, **The relations of Miculicz's disease to tuberculosis and the way of infection in tuberculous disease of the lachrymal gland**) describe a patient with typical Miculicz's disease, but no indications of tuberculosis. The tumors of the lachrymal gland were removed and three years later the patient was still healthy. No syphilis, leucæmia, or pseudoleucæmia. The histological picture of the extirpated tumors resembled that of tuberculosis, but there was no reaction to tuberculin, no tubercle bacilli, and no positive result from inoculation. They conclude that there are cases of Miculicz's disease which histologically and by the history excite suspicion of tuberculosis when the latter is not present.

On the other hand, it is to be remarked that in some rare cases the tubercle bacillus is able to produce the clinical and histological picture of the typical Miculicz's disease. In the great majority of cases the tuberculous disease of the lachrymal gland appears to originate endogenously and then to infect the conjunctiva. This view seems to be confirmed by clinical observations and experimental investigations. K.

MENDEZ (70, **Gumma of the lachrymal gland**) saw a tumor of the lachrymal gland as large as a hazel-nut in a patient 51 years old. The histological examination showed it to be a gumma. Syphilis of the lachrymal gland is extremely rare, but it may occur in all stages of the disease. The literature on the subject is very scanty. A histological examination has hitherto been possible only when the gland has been extirpated in consequence of an erroneous diagnosis.

BROSE (71, **Lachrymal gland tumors**) reports a case of adenoma of the lachrymal gland which, aside from the fact that it underwent malignant degeneration, shows nothing unique. He discusses the etiology and classification of these tumors. ALLING.

KIEHLE'S (72, **A case of dacryops**) patient was 12 years old and for two years had shown a swelling of the upper lid just internal to the median line. Upon everting the lid a bluish cyst of the size and shape of a small pecan nut came into view. The cyst varied in size, especially increasing after crying, and caused ptosis. After dissecting out the cyst there was no recurrence. Only twenty-four similar cases were found in literature. ALLING.

Both of ELLIOT'S (73, **Two cases of pneumocele of the lachrymal sac**) patients were Hindu males who came for cataract extraction. When the nose was held and the patient expired forcibly a distinct swelling appeared in the region of the sac. The canaliculi were impervious to fluorescin and the sacs emptied the air into the nose. In the second case a clear musical sound, due probably to a valve-like fold, was heard during the egress of the air and could be perceived several feet away. BLAKE.

X.—ORBITS AND ACCESSORY SINUSES

74. PASCHEFF, C. **Streptococcal abscess of the orbit in a patient with malarial cachexia.** *Annales d'oculistique*, cxliii., p. 42.

75. GOLOWIN, S. S. **Sclerosis orbitæ inflammatoria progressiva (an undescribed form of inflammation of the orbit.)** *Ibid.*, cxliii., p. 161.

76. WIRTHS, M. **Metastatic orbital abscesses and the visual disturbances attending their course.** *Zeitschr. f. Augenh.*, xxiii., 6, p. 506.

77. DUTOIT. **The relations between emphysema of the orbit and traumatic enophthalmos.** *Ibid.*, xxiii., 5, p. 414.

78. HANSELL, H. F. **A case of osseous tumor of the orbit.** *Ophthalmic Record*, March, 1910.

79. ALT, A., and SAUER, W. E. **A case of orbital cyst.** *Amer. Jour. of Ophthalmology*, Feb., 1910.

80. MARKOW, J. E. **The fourth echinococcus in the orbit.** *Westn. Ophth.*, 1910, No. 5.

81. ALMANN, B. D. **A case of pulsating exophthalmos.** *Ibid.*, 1909, No. 12.

82. WAGENMANN. **Multiple lipodermoid in an eye.** *Arch. f. Ophthalm.*, lxxiv., p. 511.

83. SUGANUMA, S. **The so-called chloroma and its histogenesis.** *Klin. Monatsbl. f. Augenheilk.*, xlviii., 1, 5–6, p. 612.

84. GUTMANN, ADOLF. **Eye symptoms in diseases of the frontal sinus and of the ethmoid cells.** *Deutsche med. Wochensch.*, 1910, p. 1195.

85. REBER, WENDELL. **Differential diagnosis of orbital affections occasioned by sinusitis, including a report of a case of thrombosis of the cavernous sinus.** *Ophthalmology*, April, 1910.

86. TRUC, H., and LEMOINE, P. **Bilateral mucocele of the frontal sinus.** *Revue générale d'ophtalmologie*, xxix., p. 195.

87. MARX, H. **Osteoma of the nasal cavity with rare ocular complications.** *Arch. f. Ophthalm.*, lxxiv., p. 311.

PASCHEFF (74, **Streptococcal abscess of the orbit in a patient with malarial cachexia**) observed in an 18-year-old patient suffering from malaria an orbital abscess caused by streptococci which produced exophthalmos and reduction of vision to counting fingers at 0.8*m*. The veins in the optic papilla were dilated. After evacuation of the pus the patient recovered with a vision of $\frac{6}{10}$. The starting point of the streptococcus infection could not be determined.

BERGER.

GOLOWIN (75, **Sclerosis orbitæ inflammatoria progressiva**) observed in a man 30 years old a progressive, chronic inflammatory process in the left orbit which had started seven years before and for five years had involved the right orbit. The symptoms consisted of the periodical recurrence of an inflammatory œdema in the orbit accompanied by severe pain, and of the origin, or aggravation, of an exophthalmos during

the attacks, which aggravation became persistent, and of progressive decrease of the motility of the eyes.

In the course of the last year an exfoliation of the epithelium in the lower part of the cornea had occurred which resulted in an ulcer with hypopyon which finally healed, leaving an opacity. The papilla was pale, the arteries small, the veins dilated. The movements of the eyes were restricted in all directions and during the exacerbations there was hypertonia. In the right eye there was œdema of the lids, moderate exophthalmos, a rather pale papilla, and the movements were restricted. Vision was 1. Temperature normal. Gradually the skin of the lids and of the neighboring parts lost its elasticity, became thin and dense. The patient said that during the last two years he had suffered from acute colitis. The exacerbations of colitis were coincident with the exacerbations of the eye disease. The liver and spleen were enlarged. The urine contained albumin, red blood corpuscles, and pus; there was a diffuse œdema of the legs and tenderness along the nerves. After the subsidence of the ocular attacks all these symptoms disappeared.

An exploration of the orbit was made by means of an orbitotomy and an excised portion of the orbital tissue was recognized to be sclerotically thickened connective tissue. The author believes that this was a case of chronic inflammation produced by infection which bears some resemblance to elephantiasis.

BERGER and HIRSCHMANN.

WIRTHS (76, **Metastatic orbital abscesses and the visual disturbances attending their course**) saw a metastatic orbital abscess from a panaritium in a girl 14 years old. He obtained a pure culture of the staphylococcus pyogenes aureus from both foci. The diagnosis was made after an exploratory puncture, because aside from the exophthalmos the principal symptoms of an orbital abscess, fever, swelling of the lid, redness and chemosis of the conjunctiva, were completely absent. The vision was much reduced and there was a central scotoma, at first relative, later absolute. The ophthalmoscopic picture was that of an almost complete arterial obstruction. After incision and evacuation the inflammatory symptoms passed away, all the functional disturbances cleared

up, and the ophthalmoscopic picture again became normal. Probably the central artery was compressed at its entrance into the optic nerve trunk, or there was a compression of its branches by the increased intraocular tension induced by the orbital pressure. K.

DUTOIT (77, **The relations between emphysema of the orbit and traumatic enophthalmos**) quotes Fuchs as saying that a contusion of the eye is necessary for the production of emphysema of the orbit. The contents of the globe then press toward the place of least resistance, the lamina papyracea, and produce a fissure there. Scleral rupture and emphysema exclude each other according to Fuchs. Salus claims that the fissures usually originate from contrecoup; that Fuchs's method is only possible, for when the eye alone is struck there results either rupture of the globe or a laceration of its supports, and later enophthalmos. Dutoit gives a series of cases; in three there was a lesion of the lamina papyracea, in one there was an indirect orbital fracture. Concerning the pathology of enophthalmos there is no positive theory. K.

HANSELL (78, **A case of osseous tumor of the orbit**) removed a bony tumor from the inner wall of the orbit to which it was fastened by a small pedicle of bone. Operation was performed by an incision through the lid without disturbing the eyeball. The patient recovered entirely from the diplopia and exophthalmos, with perfect vision. ALLING.

A young man seen by ALT and SAUER (79, **A case of orbital cyst**) gave a history of a swelling on the nasal side of the left eye of seven years' duration. Marked exophthalmos down and out was present. He had had attacks of pain in the orbit and fever but no knowledge of nasal trouble. The cyst ruptured at operation, extruding blood-tinged viscid mucus. No opening was found into the sinuses. After two attacks of pain and the occurrence of an abscess a careful nasal examination showed the ethmoid cells involved. Treatment of these by a radical operation brought about a complete recovery. ALLING.

MARKOW (80, **The fourth echinococcus in the orbit**)

reports the fourth case in his practice in which he has removed an echinococcal cyst from the orbit. The patient was a girl 13 years old who had exophthalmos, strabismus divergens, and deorsum vergens of the right eye, the movements of which were somewhat restricted, particularly upward and inward, and the pupil of which was somewhat dilated. A round-oval, elastic, tensely fluctuating, immovable, painless tumor as large as a dove's or hen's egg could be felt deep in the orbit. The vision was $\frac{10}{20}$. The papilla was œdematous. The beginning of the exophthalmos had been noticed two years before. Less than a year before there had been a spontaneous evacuation from the tumor, after which the eye regained its normal position, but in a few months began to protrude again. At the operation the cyst ruptured and evacuated with the fluid 15 daughter cysts, about as large as hazel-nuts. The operation was followed by headache, a rise of temperature, a swelling of the cheek, and finally by an itching eruption on the skin that resembled the rash of scarlet fever which disappeared again in a couple of days. These symptoms were ascribed to poisoning by the echinococcus toxin. After a month the patient was discharged, with the wound nearly healed and vision completely restored.

HIRSCHMANN.

ALMANN'S (81, **A case of pulsating exophthalmos**) patient was a girl 14 years old. The exophthalmos was first noticed by the parents when the child was 3 years old, after an attack of measles, and remained the entire time in about the same condition. Trauma was absolutely denied. Vision 1 in each eye. In the affected eye the veins of the papilla were dilated and tortuous. Pressure on the carotid checked the pulsation. HIRSCHMANN.

WAGENMANN'S (82, **Multiple lipodermoid in an eye**) case was notable in several ways. The occurrence of two such tumors in one eye is rare. Both lipodermoids were atypical; one lay downward and inward on the sclera at the corneal margin, the other inward and upward between the superior and internal recti. The latter had an uneven surface and had several long black hairs that protruded from the conjunctival sac. The tumor at the corneo-scleral margin, which had a smooth hairless surface, showed histologically a simple con-

struction of connective tissue and fat without hairs and glands, with an epithelial coat of several layers. The conjunctival tumor, on the contrary, presented a great many of the constituents of the cutis. Both tumors were teratoid neoplasms of dermoid character, as is the case in all these growths. Even the conjunctival tumors of the transition folds, which often appear clinically to be pure lipomata, histologically prove to be lipodermoids. K.

SUGANUMA (83, **The so-called chloroma and its histogenesis**) reports a rare case of the so-called chloroma in a Japanese boy 12 years old. The chloroma is characterized by leucæmic changes in the blood and peculiar green neoplasms in almost all parts of the body. These typical nodules were found in the roof of the skull, in both orbits, and in the temporal fossæ; the kidneys and testicles were diseased. There was neither a lymphoma nor a tumor of the spleen. Very characteristic changes were found in the bone marrow and blood: no lymphæmia, but myelæmia, few lymphocytes, but very many myelocytes, large mononucleated round cells with neutrophil granulated protoplasm. The neoplasms were infiltrated mainly with these cells; the tumors showed neither hemorrhages nor blood-vessels. The nodules on the roof of the skull were in many cases connected with the bone marrow. The green color of the tumors was caused by intracellular pigment granules, all of which gave a fatty reaction. The nature of the chloroma is still obscure; in general a lymphatic and a myeloid form are distinguished; both are secondary appearances in a disease of the lymphatic and hæmatopoietic systems. The myeloid form was present in this case; the bone marrow was primarily diseased and from it the tumors probably developed. The etiology is uncertain; whether tuberculosis plays a part, as some authors claim, is very questionable. Only five cases of this interesting disease have been published. K.

In empyemas of the frontal sinus and ethmoid cells which have ruptured into the orbit GUTMANN (84, **Eye symptoms in diseases of the frontal sinus and of the ethmoid cells**) considers the ophthalmologist to be called upon to operate, while empyemas of the antrum of Highmore that excite

ocular troubles should be treated by the rhinologist. Empyema of the ethmoid can frequently be treated successfully with hot applications. It must not be overlooked that a radical operation, particularly on the frontal sinus, may leave behind permanent evidences in the eye, *e. g.*, obliquity and a slit formation of the palpebral fissure, as well as paralysis of the trochlearis, and that recurrences on the cavities cannot be excluded.

REBER (85, **Differential diagnosis of orbital affections occasioned by sinusitis, including a report of a case of thrombosis of the cavernous sinus**) discusses the signs and symptoms of orbital affections arising from infection of any of the several nasal accessory sinuses. The patient with thrombosis of the cavernous sinus was a woman of 54 who was diabetic. Following a "grippe-like" attack and suppurative tonsillitis there developed, two days later, rigors, prostration, temporal neuralgia, diplopia, greatly swollen lids, and ptosis, first on one side and twelve hours later on the other. Operation was not performed, because of her condition. The writer recommends more frequent and thorough study of the orbital involvement by the rhinologist.

BLAKE.

The case of mucocele of the frontal sinus observed by TRUC and LEMOINE (86, **Bilateral mucocele of the frontal sinus**) is worthy of note because such a bilateral occurrence is rare. The patient was 69 years old, had exophthalmos, paleness of the optic papillæ (vision right eye 0.4, left $\frac{4}{5}$), blepharoptosis, and lachrymation. Recovery followed opening of the left sinus; it was not necessary to open the other because the two communicated.

BERGER.

MARX (87, **Osteoma of the nasal cavity with rare ocular complications**) saw two osteomata of the accessory sinuses which produced rare complications on the part of the eyes. In the first case, an osteoma of the frontal sinus, there was an emphysema of the conjunctiva, such as has never been observed before, which was produced by the entrance of air from the sinus during a fit of sneezing. The second case was one of an enormous osteoma which came from the sphenoid. It was not less than 7*cm* long, 2.5*cm* broad, and

3*cm* thick. As the clinical picture resembled that of an orbital phlegmon, the diagnosis was not made positive before the operation. Such a complication is extremely remarkable, because hitherto the absence of inflammatory symptoms in the orbit has been considered typical of osteomata of the accessory sinuses.

XI. CONJUNCTIVA.

88. SHOEMAKER, J. F. **Etiology and treatment of certain forms of conjunctivitis.** *Amer. Jour. of Ophthalmology*, Jan., 1910.

89. TROUSSEAU, A. **A new variety of conjunctivitis.** *Annales d'ocul.*, cxliii., p. 27.

90. KRAUSS, P. **Report of a case of Parinaud's conjunctivitis with unusual complications.** *Annals of Ophthalmology*, Jan., 1910.

91. MIYASCHITA, S. **A contribution to the pathology of conjunctivitis due to diplobacilli.** *Klin. Monatsbl. f. Augenheilk.*, xlviii., 1, 5–6, p. 458.

92. ADDARIO, C. **Acute conjunctivitis caused by streptobacilli, or short bacilli of the vagina.** *Arch. f. Ophth.*, lxxiv.

93. MCKEE, S. H. **The trachoma bodies from the normal conjunctiva.** *Ophthalmic Record*, May, 1910.

94. HALBERSTAEDTER, L., and v. PROWAZEK, S. **The signification of the chlamydozoa in trachoma and blennorrhœa.** *Berl. klin. Wochensch.*, 1910, No. 15, p. 661.

95. HEYMANN, R. **The places where v. Prowazek's corpuscles are found.** *Berl. klin. Wochensch.*, 1910, No. 15, p. 663.

96. KUTSCHRENKO, P. A. **The etiology of trachoma. Preliminary communication.** *Russk. Wratsch.*, 1910, No. 18.

97. ISCHIKAWA, K. **A contribution to the question of trachoma.** *Arch. f. Ophthalm.*, lxxiii., 2, p. 302.

98. PASCHEFF, G. **Studies concerning the nature and etiology of trachoma verum.** *Arch. d'ophtalmologie*, xxxi., p. 6.

99. PROKOPENKO, P. P. **The treatment of trachoma by radium rays.** *Westn. Ophthalm.*, 1910, No. 5.

100. FAINITZKY, P. K. **A case of tuberculosis of the conjunctiva treated with tuberculin.** *Westn. Ophthalm.*, 1910, No. 4.

101. PROTOPOPOW, G. N. **A case of syphilitic affection of the tarsal cartilage (tarsitis syphilitica).** *Russk. Wratsch.*, 1910, No. 10.

102. ADAM, C. **The pathology of pemphigus conjunctivæ.** *Zeitschrift f. Augenheilkunde*, xxiii., 1, p. 35.

103. WIENER, M., and ALT, A. **A case of cavernous lymphangioma of the bulbar conjunctiva.** *Amer. Jour. of Ophthalmology*, Jan., 1910.

104. SNELL, A. C. **Injury to the eye from the presence of anilin pencil in the conjunctival cul-de-sac.** *Ophthalmology*, Jan., 1910.

105. CALHOUN, F. P. **The present status of Calmette's conjunctival reaction in the diagnosis of tuberculosis.** *Ophthalmology*, April, 1910.

SHOEMAKER (88, **Etiology and treatment of certain forms of conjunctivitis**) draws attention to auto-intoxication as a cause of conjunctivitis, which he thinks is not generally appreciated. He shows how theoretically, at least, the various forms of auto-intoxication might produce an inflammation of the conjunctiva. Several of his cases have shown a coincidence between the attacks of conjunctivitis and the other symptoms of auto-intoxication. There is nothing characteristic about the form of conjunctivitis. Treatment is directed towards the stomach, bowels, and liver. Acidemia is combated with an anti-acid and the best is acetanilid.

ALLING.

TROUSSEAU (89, **A new variety of conjunctivitis**) observed in a young man on five different occasions attacks of a peculiar conjunctivitis, which was characterized by the appearance of several nodules 3 or 4*mm* broad by 4 to 6*mm* long in the conjunctiva bulbi or the transition fold, while the lids and lymphatic glands remained intact. Their onset was preceded by attacks of œdema in the skin as large as a dollar, especially in the scalp. Each attack averaged three months in duration. Treatment was of no avail.

BERGER.

KRAUSS (90, **Report of a case of Parinaud's conjunctivitis with unusual complications**) observed a negro child two and a half years of age with a purulent conjunctivitis of one eye and enlargement of preauricular, submaxillary, and sublingual glands of the same side. There were ulcerated areas and later granulomatous masses of large size springing from the conjunctiva. The disease extended into the lachrymal sac and produced purulent discharge from the nostril. No bacteria were found and the von Pirquet reaction was negative.

ALLING.

MIYASCHITA (91, **A contribution to the pathology of conjunctivitis due to diplobacilli**) found in a case of this nature the diplobacilli of Morax-Axenfeld and staphylococci. There was a great papillary proliferation of the palpebral conjunctiva, especially over the tarsus. The principal part of the infiltration was formed of plasma cells. The epithelium showed an unusually great amount of mucus. K.

ADDARIO's (92, **Acute conjunctivitis caused by strepto-**

bacilli, or short bacilli of the vagina) patient had his conjunctiva infected by the vaginal secretion of a healthy woman. An extremely severe acute conjunctivitis developed in which positively no gonococci were to be found, but the streptobacillus found in the healthy vaginal secretion was the only morbific agent present. The cornea did not become involved. Inoculation experiments showed that the streptobacillus conjunctivitis runs a subacute course and is characterized by œdema of the conjunctiva and lids, free muco-purulent secretion, redness and thickening of the conjunctiva tarsi. Without treatment the inflammation shows very little tendency toward recovery, but disappears in from one to two weeks under treatment with silver nitrate. K.

McKee (93, **The trachoma bodies from the normal conjunctiva**) reports having found the trachoma bodies of Prowazek and Halberstaedter in the epithelial cells from the healthy conjunctiva of a new-born babe. Slides were stained with Giemsa's solution and appeared to be identical with those from a case clinically trachoma.

Blake.

Halberstaedter and v. Prowazek (94, **The signification of the chlamydozoa in trachoma and blennorrhœa**) divide the development of chlamydozoa into three parts: 1, Initial bodies of Lindner; 2, elementary bodies (end stages); and 3, remnant bodies. There is a dimorphous development of the chlamydozoa, but it may not be identified with that of the protozoa. The authors see themselves driven to the theory that trachoma is derived from the epithelium of the genital tract and that the well-definable symptoms of trachoma play a secondary part, for the chlamydozoa taken from non-gonorrhœal ophthalmoblennorrhœa and urethritis produce in the conjunctiva of monkeys the clinical picture shown in human granular trachoma.

Heymann (95, **The places where v. Prowazek's corpuscles are found**) finds Prowazek's bodies in trachomatous infants and in genital diseases frequently associated with gonococci. On the conjunctiva of monkeys they excite blennorrhœal and then follicular symptoms, but he seriously hesitates to call the inclusions the pathogenic agents of trachoma.

Kutschrenko (96, **The etiology of trachoma. Preliminary**

communication) found the Prowazek-Greeff trachoma granules in cases of old trachoma which had been treated with silver nitrate and cupric sulphate, as well as in a case of conjunctivitis which had been considered a case of chronic blennorrhœa rather than of trachoma. He therefore believes that great caution should be exercised in the acceptance of these bodies as the morbific agents of trachoma.

HIRSCHMANN.

ISCHIKAWA (97, **A contribution to the question of trachoma**) found in the trachomatous pannus a new formation of plasma cells, young connective-tissue cells, and blood-vessels; he sees in the pannus a chronic inflammatory new formation with proliferation of plasma and connective-tissue cells going forward from the first beginning of the disease. This condition corresponds to the theory of Saemisch, who thought the real change in trachoma was a diffuse inflammatory proliferation of the subconjunctival layer of tissue. He could not find follicles in trachomatous pannus. He believes that the inflammatory tissue changes in the cornea and in the conjunctiva present the truth of the pathological trachomatous process. Adenoid condition and follicle formation are according to him only an anatomical contamination of the trachomatous change in the conjunctiva. The follicle is a product of the adenoid tissue, but it is to be sharply distinguished from the trachomatous process.

From his pathological studies PASCHEFF (98, **Studies concerning the nature and etiology of trachoma verum**) concludes that the fundamental changes in trachoma correspond to those met with in granulations of the pharynx and adenoids of the naso-pharynx. The granulations and follicles of trachoma originate chiefly in the vascular portions of the conjunctiva; the former contain more adenoid tissue than the latter, which are usually present only in the superficial layers of the conjunctiva. Granulations and follicles may be present in one and the same eye, frequently associated with phlyctenulæ at the limbus. The instillation of tuberculin into the conjunctival sac may occasion both the origin of follicles and of phlyctenulæ in the conjunctiva. The author thinks that some chemical, toxic, or bacteriological agent excites in those who are susceptible the lympho-adenoid vegeta-

tions of the throat, of the naso-pharynx, or of the conjunctiva, and that a special predisposition to such development exists in the lymphatic constitution.

BERGER.

PROKOPENKO (99, **The treatment of trachoma by radium rays**) systematically treated 6 cases of indubitable granular trachoma by radium. The mucous membrane of the granular tarsal surfaces, the transition folds, the plicæ semilunares, and the caruncles was irradiated from 2 to 7 minutes at first daily, then at short intervals, with 5*mgs* of radio-active radium bromate contained in a glass tube. Only the upper or the lower lid was irradiated each time; the eye was covered by the lid not undergoing treatment. In all 6 cases the granules gradually became smaller and fewer and finally disappeared. Even in the cases in which the treatment was not continued to the end a complete recovery was secured. No recurrences at the end of 1½ years. The duration of treatment varied from 121 to 215 minutes of irradiation for each eye. The author is of the opinion that the radium rays act directly upon the cells in the follicles and that they have a bactericide property. HIRSCHMANN.

FAINITZKY'S (100, **A case of tuberculosis of the conjunctiva treated with tuberculin**) patient, a girl 16 years old, had complained of a swelling of the lids for more than three years. The reddened, swollen conjunctiva of both eyes was thickly covered with cock's-comb-like granular excrescences, the upper transition fold was nodular and infiltrated, the conjunctiva bulbi was slightly œdematous, and between the right inner canthus and the bridge of the nose could be felt a painless tumor as large as a bean, immovable and not adherent to the skin. A similar tumor as large as a pea was also present at the left inner canthus. The right preauricular lymphatic gland was as large as a bean, hard and tender, but not adherent to the skin. Calmette's tuberculin reaction in the left eye caused a severe irritation that lasted for nineteen days. Koch's bacilli could not be found in the conjunctival secretion. The microscopic examination of an excised bit of the conjunctiva revealed no characteristic signs of a tubercle. Anti-syphilitic treatment was tried first, but in vain. Two guinea-pigs were inoculated beneath the

skin of the abdomen with pieces of the diseased conjunctiva, and nodules with fistulæ developed at these places in the secretion from which tubercle bacilli were demonstrated. Both animals died of tuberculosis. The tuberculin treatment consisted of subcutaneous injections of TA and local instillations of TA in the eyes. The instillations were borne badly and therefore were discontinued. Injections kept up for three months gave no marked improvement. But the author will not yet pass a negative judgment on the applicability of tuberculin treatment to tuberculosis of the eye.

HIRSCHMANN.

PROTOPOPOW (101, **A case of syphilitic affection of the tarsal cartilage, tarsitis syphilitica**) describes a slight eversion and diffuse swelling of the right upper lid of a woman 48 years old; the skin was hyperæmic, but freely movable; at the free margin were several little ulcers with dirty yellow bases: the tarsal conjunctiva was gray-red, infiltrated, and presented a fatty appearance; the cartilage was considerably thickened and painless. The scleral conjunctiva was slightly hyperæmic. In all other respects the eyes were normal. Marked symptoms of general syphilis were present. Inunctions and iodide resulted in a cure in 1½ months. This is the 23d case on record.

HIRSCHMANN.

ADAM (102, **The pathology of pemphigus conjunctivæ**) had the opportunity to add the anatomical examination to the clinical history of a case of pemphigus conjunctivæ; a transplantation of mucous membrane from the mouth made a year before death increases the histological interest. The characteristic of pemphigus of the eye, which is doubtless a local phenomenon of general pemphigus, is not the rare formation of vesicles, but an inflammation of the subepithelial and adenoid layers with secondary cicatrization. The diminution of the conjunctival sac is to be ascribed to this cicatricial transformation of the foci of infiltration. The epithelium is thrown off the cornea and irregularly regenerated; this loss is replaced by proliferation from the neighboring epithelium, or the neighboring conjunctiva. Signs of chronic inflammation are demonstrable on the globe as far back as the equator. Transplantations appear to be fairly effectual;

if one is performed the incision is always kept near the globe in order to avoid cutting through the tarsus and opening the orbit in the construction of the new conjunctival sac. The transplanted mucous membrane preserves perfectly the character of its epithelium; in other respects it adapts itself to its new situation.

The patient described by WIENER and ALT (103, **A case of cavernous lymphangioma of the bulbar conjunctiva**) was a man 30 years old showing a conical translucent tumor, measuring 11*mm* at the base and protruding 7*mm* between the lids. It had been present since birth but had increased during the past seven years. Histologically the tumor showed a thick covering of epithelial cells and cavities lined with endothelial cells, containing a coagulated grumous mass with a few leucocytes. These tumors are rare.

ALLING.

SNELL (104, **Injury to the eye from the presence of anilin pencil in the conjunctival cul-de-sac**) removed a piece of anilin pencil which was buried in the bulbar conjunctiva. There was œdema, chemosis, and deep staining of the eye. The corneal epithelium was hazy and rough. He claimed that the coloring matter had penetrated into the anterior chamber and discolored the lower part of the aqueous like an hyphema. The pigment disappeared in nine days, but the cornea remained hazy a few days longer. Tannic acid and hydrogen peroxide have been recommended as decolorizing agents, but it is known that the stains will spontaneously disappear. The danger lies in the caustic and irritating qualities of the soluble anilin dyes.

ALLING.

CALHOUN (105, **The present status of Calmette's conjunctival reaction in the diagnosis of tuberculosis**) gives a good résumé of the literature of the conjunctival test but adds nothing new.

BLAKE.

XII.—CORNEA, SCLERA, AND ANTERIOR CHAMBER.

106. SEEFELDER, R. **Further contribution to the pathological anatomy of marginal degeneration of the cornea.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., 1, 3, p. 321.

107. ROENNE, H. **Herpes corneæ menstrualis.** *Ibid.*, p. 328.

108. WEINSTEIN, GEORG. **The variations of herpes corneæ observed in the eye clinic at Rostock from Oct. 1, 1904, to Oct. 1, 1909.** *Inaug. Diss.*, Rostock, 1910.

109. IGERSHEIMER, J. **Keratitis parenchymatosa a true syphilitic disease. Preliminary communication.** *Deutsche. med. Wochensch.*, 1910, p. 938.

110. ELEONSKAJA, W. N. **Pathological anatomy of keratitis parenchymatosa.** *Westn. Ophth.*, 1910, No. 1.

111. GILBERT, W. **Keratitis parenchymatosa annularis.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., 1, 3, p. 460.

112. SSUROW, G. J. **Course of pannus trachomatosus when protected by egg membranes.** *Wojenno medic. Journ.*, March, 1910.

113. JENSEN, E. **Etiology of ulcus corneæ serpens.** *Arch. f. Ophthalm.*, lxxiii., 3, p. 579.

114. TERTSCH. **Ring abscess of the cornea.** *Ibid.*, 2, p. 314.

115. CRAMER. **Ring abscess of the cornea.** *Klin. Monatsbl. f. Augenheilkunde*, xlviii., 1, 5–6, p. 620.

116. PATTERSON, J. A. **Ring abscess of the cornea.** *Ophthalmic Record*, June, 1910.

117. CHARLES, J. W. **Ring ulcer of the cornea followed by an apparent incipient ectasis of the central portion.** *American Journal of Ophthalmology*, May, 1910.

118. NAPP. **Dermoid of the cornea with elastic cartilage.** *Zeitschr. f. Augenheilkunde*, xxiii., 3, p. 240.

119. VILLARD, H. **Congenital serous cyst of the sclera.** *Arch. d'ophtalmologie*, xxxi., p. 36.

120. COATS, G. **Congenital anterior staphyloma.** *Ophthalmoscope*, April, 1910.

121. STEPHENSON, S. **A peculiar appearance of the eyes affecting twenty-one members belonging to four generations of a family.** *Ophthalmoscope*, May, 1910.

SEEFELDER (106, **Further contribution to the pathological anatomy of marginal degeneration of the cornea**) gives the findings in a new case of gerontoxon with commencing furrow formation. From these findings he is inclined to think that it is probably due to a fatty degeneration of the lamellæ of the cornea. This fact is interesting because the accumulation of fat in the lamellæ of the cornea forms the anatomical basis of the arcus senilis and the clinical relation almost always observed between the two conditions seems now to be confirmed anatomically. K.

ROENNE (107, **Herpes corneæ menstrualis**) observed in a healthy woman 42 years old a herpes corneæ which recurred

regularly with the menses and was therefore termed by him herpes corneæ menstrualis. The disease usually started 5 days after the cessation of menstruation with extremely severe eye symptoms and disappeared in from 2 to 7 days. The clinical picture was that of keratitis punctata superficialis. The periodicity of the attacks and their connection with menstruation make the picture characteristic. A few cases of similar association of corneal diseases with menstruation have been recorded. K.

During the past five years there has been a marked increase in herpes corneæ according to WEINSTEIN (108, **The variations of herpes corneæ observed in the eye clinic at Rostock from Oct. 1, 1904, to Oct. 1, 1909**). This group includes keratitis dendritica and disciformis as well as herpes zoster. The absolute homogeneousness of the keratitis dendritica following malaria and influenza, its appearance after traumatism, its presence in one eye with typical herpes corneæ in the other, are features which characterize keratitis dendritica as not the manifestation of a specific lesion, particularly of the infectious diseases. The important part played by gout in the origin of the various forms of herpes should be taken into account, so one does well to content himself temporarily with the position that the herpetic diseases of the cornea are due to various causes that excite a condition of irritation of the trigeminus. Of 173 cases, 123 presented the typical picture of herpes corneæ, 23 keratitis dendritica, 21 keratitis disciformis, 6 herpes zoster. Both eyes were affected in only 6 cases. Most were met with between March and July. The disease lasts from ten days to two months. Relapses occur in about one fifth of the cases.

IGERSHEIMER (109, **Keratitis parenchymatosa a true syphilitic disease. Preliminary communication**) demonstrated the presence of the spirochæta pallida in a piece of tissue freshly excised from a parenchymatously diseased cornea of a girl 14 years old who was positively suffering from hereditary syphilis.

The findings of ELEONSKAJA (110, **Pathological anatomy of keratitis parenchymatosa**) were: The corneal epithelium varied in thickness; in the upper layer the cells were flat, in the deeper layers they varied in form and size. Bowman's

membrane was almost totally destroyed. Between the epithelium and the substantia propria was a young, vascular connective tissue. The substantia propria contained numerous vessels and numerous cells with large nuclei; the fibres were pressed apart and were in places broken down. The deepest layers, next to Descemet's membrane, were broken down and showed necrotic, hyalinized spots. Descemet's membrane was wanting in places. Endothelium was nowhere present. The iris and ciliary bodies were atrophied. The sclera was thin. The choroid was changed into a thin membrane poorly supplied with blood. In the retina the nervous elements were atrophied and the supporting tissue sclerosed. The vitreous contained round, mono-nucleated cells.

HIRSCHMANN.

GILBERT (111, **Keratitis parenchymatosa annularis**) found the infiltrate circular in 14 out of 66 cases of parenchymatous keratitis, but it later became diffuse. The etiology is the same in both forms. He finds no distinguishing characteristics to mark it as a distinct form. K.

SSUROW (112, **Course of pannus trachomatosus when protected by egg membranes**) obtained good results in pannus crassus by covering the entire conjunctiva with egg membranes applied freshly every day. The conjunctiva can then be treated vigorously. The application of the egg membranes acts as a dressing, and is useful even in serpiginous ulcers if not purulent. HIRSCHMANN.

JENSEN (113, **Etiology of ulcus corneæ serpens**) advances the hypothesis that a recurrent bullous keratitis exists between the injury and the infection. Many features of the disease may be explained by this hypothesis. Therapeutically he removes the epithelium early and then applies tincture of iodin. K.

TERTSCH (114, **Ring abscess of the cornea**) finds histologically that the ring abscess is a primary necrosis of the most posterior lamellæ of the cornea with secondary production of the ring. It is not an independent disease, but is met with only in grave, usually purulent, inflammations of the interior of the eye which induce necrotic changes in the coats of the eye. It is caused by various toxins, not only bacteriological but also products of the disintegration of tumors. K.

CRAMER (115, **Ring abscess of the cornea**) observed a grave ring abscess of the cornea after a superficial injury, which ran a rapid course. Within 24 hours the corneo-scleral margin had been destroyed so that vitreous escaped when it was touched. The conjunctiva was not involved. No micro-organisms were found. K.

PATTERSON'S (116, **Ring abscess of the cornea**) case was a 40-year-old man convalescing from pneumonia. The ring abscess appeared simultaneously with herpes febrilis of the lip and eyelid. An iridocyclitis was followed by ring abscess and Descemetitis, hypopyon, etc. Cultures showed staphylococcus pyogenes aureus. Treatment with mydriatics, nitric acid cauterization, and staphylococcus vaccine produced a healing with corneal nebulæ. BLAKE.

CHARLES'S (117, **Ring ulcer of the cornea followed by an apparent incipient ectasis of the central portion**) patient had a ring ulcer, which in healing was nourished by vessels coming across the cornea instead of from the limbus near the ulcer. This he thinks was due to the disturbance of the nerve endings at the limbus. When seen five years later the patient showed a cicatrix where the ulcer had been and a clear ectatic area in the centre giving the appearance of a transparent bead superimposed upon the cornea. Vision was good. BLAKE.

NAPP (118, **Dermoid of the cornea with elastic cartilage**) extirpated a lipodermoid as large as a hazel-nut from the cornea of an infant. The connective tissue contained numerous elastic fibres and the plates of cartilage were not hyaline, as they usually are, but elastic. No hair-bulbs or pieces of bone were found. K.

VILLARD (119, **Congenital serous cyst of the sclera**) found in a boy 5 years old a congenital serous cyst of the sclera nearly as large as a bean near the lower margin of the cornea. It was lined by a fibrous membrane covered with epithelium which corresponded to the epithelium of the conjunctiva bulbi. He believes that the cyst originated in an embryonal invagination of the epithelium of the conjunctiva bulbi into the scleral tissue. BERGER.

COATS (120, **Congenital anterior staphyloma**). In this condition the child is born with a lesion which closely resembles the results of a postnatal perforating ulcer. Micro-

scopically the similarity is striking. Most writers have regarded the origin of the condition from intra-uterine ulceration as self-evident. Recently however, Treacher Collins, reviving an old hypothesis, has suggested that lack of differentiation is an essential factor. Coats carefully considers these two theories and decides that the ulcerative theory is the correct one. A case is adduced and illustrated by microphotographs. T. HARRISON BUTLER.

STEPHENSON (121, **A peculiar appearance of the eyes affecting twenty-one members belonging to four generations of a family**). The author has traced the pedigree, which is charted, of a boy who had "leaden" sclerotics. The defect is traced through four generations comprising 32 individuals. Peters has traced a similar pedigree. Roll exhibited a case with sky-blue sclerotics to the Ophthalmological Society of the United Kingdom. T. HARRISON BUTLER.

XIII.—LENS. (Reviewed by Dr. NICOLAI, Berlin.)

122. SCHANZ and STOCKHAUSEN. **The fluorescence of the lens.** *Arch. f. Ophthalmologie*, lxxiii., 1, p. 184.

123. ZENTMAYER, WILLIAM. **A case of congenital cataract of unusual type.** *Ophthalmic Record*, April, 1910.

124. HUDSON, A. C. **A clinical study of posterior traumatic cataract.** *Royal London Ophthalmic Hospital Reports*, Jan., 1910.

125. ROBINSON, J. R. **Cataract resulting from electric shock; being a brief review of the literature with a report of three cases.** *Ophthalm. Record*, April, 1910.

126. DIMITRY, T. J. **Two cases of successful extraction of senile cataract from the eyes of lepers.** *Annals of Ophthalmology*, April, 1910.

127. WRIGHT, J. W. **The removal of the cataractous lens within its capsule.** *Ophthalmology*, April, 1910.

128. KATZ, R. A. **Treatment of commencing senile cataract with eye-drops containing salts of iodin.** *Russk. Wratsch.*, 1910, No. 20.

SCHANZ and STOCKHAUSEN (122, **The fluorescence of the lens**) have shown experimentally that the short-waved light is transformed into longer-waved light in fluorescence of the lens. It is supposed that the absorption of ultra violet rays increases with age and that the changes in the lens in old age are connected with this.

ZENTMAYER'S (123, **A case of congenital cataract of unusual type**) patient showed in the right eye an irregular disk-like

grayish white opacity, with a pinhead size central dot above and to the nasal side of the centre. Surrounding this was a grayish opacity of tessellated appearance. This surrounding opacity extends almost to the equator, which is very thin, with highly refractive edges. The whole lens is dislocated upward and inward. The left eye shows a similar appearance except that the central opacity is not so deeply placed and luxation is not so great. BLAKE.

HUDSON, A. C. (124, **A clinical study of posterior traumatic cataract**). We shall make no attempt to abstract this exceedingly valuable paper, for without the figures any account would be meaningless. Mr. Hudson's paper should be read by every ophthalmologist, for the subject is of great importance, and we have seen no other paper which treats the subject quite from the author's point of view. There are figures illustrating the changes which take place after needling and showing the usual appearances which follow injuries to the lens.

T. HARRISON BUTLER.

ROBINSON'S (125, **Cataract resulting from electric shock; being a brief review of the literature with a report of three cases**) first case was an electrician, aged 31, who received a shock of 11,000 volts. One month later he noticed a slight blur which increased gradually. Examination showed numerous fine grayish dots, mostly confined to the anterior cortex. They were discrete in the central area but arranged in a pyramidal form near the equator. With the appearance of cloud-like opacities and more dots vision was reduced to $\frac{15}{100}$ at the end of fifteen months after the injury. In the second case the man was an electrician 27 years old, who received about 26,000 volts. Ophthalmoscopic examination a few weeks later showed numerous vitreous opacities but perfectly clear lenses. At the end of eighteen months diffuse haziness appeared in the lenses but no streaks or dots. The third patient was 53 years old and was first examined eighteen months after the shock. Ptosis of the right lid had appeared at once but had been cured in six months. There was then seen a sharply circumscribed opacity, largely capsular, at the nasal edge of the right lens. In the left was seen a moss-like vitreous opacity. At the extreme edge of the lens there were

bluish-black dots, about fifteen in number, forming almost a circle. Nine months later there were no further changes. The writer considers the first case to be a typical "electric cataract"; the second peculiar in the lapse of time before appearance of lenticular changes; and the third as ptosis and vitreous opacities with (questionable) lenticular changes due to electric shock. BLAKE.

The two cases reported by DIMITRY (126, **Two cases of successful extraction of senile cataract from the eyes of lepers**) were uncomplicated senile cataracts. Neither showed any leprous condition of the eyes, save madarosis in one. After the extraction the patients were treated ambulatorially and vision of $\frac{2}{3}\frac{0}{0}$ in one and $\frac{2}{4}\frac{0}{0}$ in the other was obtained. The leprous state seems to present no contra-indication to the extraction of cataract nor to retard healing. BLAKE.

WRIGHT (127, **The removal of the cataractous lens within its capsule**) has performed this operation for the past thirty years and uses neither speculum nor fixation. Section is made horizontally in the upper third of the cornea. The upper lip of the wound is then pressed inward with the thumb and only rarely is counter-pressure made at the lower corneo-scleral margin. He does not make an iridectomy unless the pupil is small, and makes a capsulotomy only when the lens does not press out easily. He gives no statistics but claims excellent results, especially freedom from vitreous prolapse. BLAKE.

In more than 60 cases during the past 11 years KATZ (128, **Treatment of commencing senile cataract with eye-drops containing salts of iodin**) has ordered instillations of 5% to 10% solutions of sodium iodide, in some cases giving eye-baths of a 2% to 5% solution of sodium iodide. At first he gave the iodides internally, but gained no benefit. He is convinced that the eye-drops alone are effective and they can be used continuously without bad effect. He has discarded subconjunctival injections because their benefits were problematical and they sometimes were harmful. He gives a tabulated statement of 21 cases treated and watched by him. In 11 cases, observed from 5 months to 7 years, the vision was greatly improved; in 8 cases, observed from 6 months to 7 years, the vision had remained unchanged, and in only 2

cases had the vision deteriorated. In a few cases he has observed the diminution or disappearance of radiating cortical opacities. Usually the marked improvement was in cases of diffuse opacity. Sclerosis of the nucleus is not prevented; instead it increases, causing myopia. Improvement appears within the first three months, usually in the first month. Interruption of the treatment is regularly followed by deterioration, especially if the interruption lasts six months.

HIRSCHMANN.

XIV.—IRIS. (Reviewed by Dr. NICOLAI, Berlin.)

129. SAUTTER, A. C. **Vitiligo iridis. A report of two cases.** *Annals of Ophthalmology*, April, 1910.

130. SHUMWAY, E. A. **Report of a case of gonorrhœal iritis successfully treated by gonococcus vaccines.** *Annals of Ophthalmology*, April, 1910.

131. POSEY, W. C. **Unusually intractable case of iritis. Etiology of iritis.** *Medical Record*, Aug. 28, 1909.

132. WORTH, C. **Cyst of the pigment epithelium of the iris.** *Royal London Ophthalmic Hospital Reports*, Jan., 1910.

133. KLEIN, S. **Inversion of the iris.** *Mediz. Blaetter*, xxxii., No. 13.

134. SNYDACKER, E. F. **Absence of iritis and choroiditis among syphilitics who have become tabetic.** *Jour. A. M. A.*, March 19, 1910.

135. SCHIRMER, O. **Hypotony a constant symptom of inflammation of the ciliary body.** *Arch. f. Ophthalm.*, lxxiv., p. 224.

SAUTTER (129, **Vitiligo iridis. A report of two cases**) describes two cases which support the belief that this condition arises from a previous attack of variola. Both patients were colored, one aged 27, the other 60. The younger patient showed in one eye eight to ten and in the other six white or grayish spots, circular or oval and mostly in the ciliary zone of the iris. In the older patient only one eye was affected, although there were evidences of a previous chronic iridocyclitis in both. In both cases there was atrophy of the iris tissue and the spots seemed to be due to bleaching of the stroma pigment. In all the cases observed so far the irides have been brown. BLAKE.

The patient treated by SHUMWAY (130, **Report of a case of gonorrhœal iritis successfully treated by gonococcus vaccines**) was a negro aged 20 who had had a urethritis one year previously. One month after developing a polyarthritis

which was treated medicinally and with vaccine injections of Neisser's bacterin of 100,000,000 dead gonococci, an iritis appeared. Nine days of treatment with atropin, dionin, and hot compresses gave no improvement. An injection of 100,000,000 dead organisms from a new supply relieved the pain and photophobia. Two more injections at intervals of three and four days gave further relief from all symptoms and at the end of three weeks the patient was discharged cured. No exacerbation of local symptoms, no general reaction, and no abscesses were observed. The vaccine injections seem to work best in metastatic gonorrhœal conditions, as iritis and arthritis. BLAKE.

POSEY (131, **Unusually intractable case of iritis. Etiology of iritis**) points out the tendency of gonorrhœal arthritis and iritis to appear in gouty patients or those who have inherited a gouty diathesis. His patient suffered from relapsing iritis of this type. ALLING.

WORTH, C. (132, **Cyst of the pigment epithelium of the iris**). This condition, which is clearly explained by a painted drawing, was seen in a child aged 5, female, who had never had iritis and whose fundus was normal. At the free edge of the pupil in the right eye were two cysts. The pupil was free and mobile. The swellings were originally present in both eyes, but those on the left iris suddenly disappeared.

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